INDIA RUBBER WORLD

FOUNDED 1889

CAOUTCHOUC Reg. U.S. Pat. Off.

GUTTA-PERCHA Reg. United Kingdom.

Published on the 1st of Each Month by

THE INDIA RUBBER PUBLISHING CO.

DIVISION OF EDWARD LYMAN BILL, INC.

420 Lexington Ave., New York, N. Y. Cable Address: Irworld, New York

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Volume 76 JUNE 1, 1927 Number 3

Contents

Subscription $3.00 Per Year Postpaid in the United States

$3.50 Per Year Postpaid to All Other Countries

EDITORIALS

Restriction's Days Numbered?

NO Daniel is needed to read the handwriting on the wall denoting the doom of crude rubber restriction. Signs of its early abandonment multiply and grow more significant. Four years and a half ago its proponents felt themselves monarchs of all they surveyed, with rights that none dared to dispute. Market factors favored them; buyers balked but stood and delivered; and hay was made while the sun shone. "After us the deluge" replaced the time-honored British motto of "Fair play."

Gradually came disquieting elements. Dutch planters, reaping price advantage without loss of liberty, were extending their holdings and they and other rubber gatherers were increasing their exports; manufacturers were finding that reclaim could largely replace raw rubber; a powerful American buying organization began accumulating large rubber reserves to stabilize the market; more British planters were protesting at the curb on their enterprise; and British consumers were finding that dear raw material was putting them at a disadvantage in selling rubber goods abroad.

Now it is announced that the British Government, gravely concerned about dwindling financial prestige, is anxious to aid in collecting American debts in Europe and would make generous concessions if the money could be paid through London. It is also stated that to arrange such a plan a high commission with powers extraordinary will soon visit Washington, and that it will even be able to assure the casting of the Restriction Act into the discard if British banks be made America's fiscal agents. Doubtless the proposition will evince much merit; but many Americans will surmise that back of it all in British high quarters is the conviction that restriction, having been weighed and found wanting, can no longer be considered a profitable policy, that it has quite outlived its usefulness, and that now is the acceptable time to make a virtue of a necessity by bartering it for a larger and more lasting advantage.

Where Hooverizing Might Help

ADVOCATES of simplification and standardization can not view without misgivings the trend to again multiply tire sizes. After getting the list of sizes scaled down from about 50 to 20, they find in 1927 that the pendulum has swung back even further than before. The assortment of low-pressure tires has mounted to 36, and there are still 24 of high-pressure sizes in demand, making a total of 60 to suit all wants,—not needs.

In trying to accommodate automobile builders, who are sometimes whimsical and unreasonable, rubber manufacturers may discover too late that such a course was neither very profitable for them nor conducive to the best interests of dealers and consumers. Overproduction is but one of the evils to which it might lead. The rubber industry has not for years been on as firm a foundation as it is today, a condition largely brought about by tempering enterprise with conservatism. Were such balance much disturbed, trade history might easily repeat some of its most unpleasant chapters.

The New Economics of Business

"KEEN competition, a constantly declining price level, and capacity that can easily cause production to run ahead of consumption are three forces now attacking profits in various lines of manufacturing," states R. M. Hudson, chief of the Division of Simplified Practice, Department of Commerce.

"Competition is not only keen between individual companies within the same industry, but also between entire industries. Manufacturers having a certain product in common are seeking as a group to win the consumers' favor over another group having common interest in another product. Instalment selling has intensified this 'new competition.'

"Declining price levels have increased the problems of the manufacturer caught between the upper millstone of consumer resistance to further rise in the cost of living, and the nether millstone of pressures to maintain current high wage levels, to meet the higher costs for materials, equipment and supplies (arising out of intense demand and threatened shortages) and to absorb the higher costs of doing business. 'Hand-to-mouth' buying has thrown the costs of carrying heavy inventories onto the manufacturer.

"Capacity beyond that required to satisfy the current rate of consumption encourages effort to increase that rate, yet circumstances operating to cut the current rate of consumption would obviously render idle much of the capacity now operating. And there is therefore question as to whether effort to force consumption for the sake of taking up present slack will not seriously jeopardize the capacity now being utilized effectively."

* * *

"BE INDEPENDENT, OWN A PLANTATION, AND GET rubber at cost," is the appeal being made to American rubber manufacturers by an enterprising land-selling firm in Ceylon. The firm would even grow and tap the trees, prepare rubber from latex, ship the factory requirement, and sell the excess, all for a modest percentage.

Rubber Compounding[1]

Rubber Scrap Sources—Regulation of Reclaim Grades—Type Reclaims—Selection in Compounding—Weight and Volume Data—Reclaim Compounds—Current Practice

Webster Norris

Reclaimed Rubber

RECLAIMED rubber is the product of processing vulcanized scrap rubber articles. The resulting stock possesses plastic quality and tensile properties varying with its scrap source, the method of reclaiming, and details of processing. The current grades of reclaim are very unlike and far superior to the so-called "shoddy" produced by the crude and small scale methods used in the early years of the reclaiming industry. Then, the term "shoddy" was more or less justified because boots and shoes which comprised the bulk of reclaimable waste rubber were processed simply by steaming the ground scrap and fiber and milling the product into rough sheets. The mechanical separation of the ground fiber before steaming resulted in a better product. This was succeeded by the acid process in which the fiber was destroyed by boiling in dilute sulphuric acid and the stock washed free of acid before steaming.

The acid process is still employed in making shoe reclaim, for which it is quite suitable because the softer composition and cure of rubber shoes is radically different from tires, inner tubes and mechanical goods. The acid process of reclaiming is not adapted for the treatment of tire and tube scrap and since these are the chief forms of rubber scrap the acid process has been superseded by the alkali process. By this method the ground scrap is steam digested with caustic soda in water for the complete removal of the fiber and free sulphur present and the reduction of the mass to an easily millable plastic stock.

The estimated reclaim production in the United States and Canada for 1926 was 180,000 tons of which about 10 per cent was made by the acid process.

Rubber Scrap Sources

The chief sources of rubber scrap are tires, pneumatic and solid, inner tubes, boots and shoes, hose and molded articles. Scrap from many other minor sources is utilized for the production of reclaim specialties to meet special manufacturing requirements. The above list, however, is the main reliance of the reclaimer supplying the general requirements of the rubber industry, namely, the manufacture of tires, tubes, rubber footwear, insulated wire, automobile topping, mechanical rubber goods, and hard rubber. The scrap sources named embrace several divisions based on such differences as rubber content, gravity, color, freedom from oxidation, metal and worthless materials.

Regulation of Grades

Every reclaiming company produces a wide variety of stocks covering a full range of qualities to meet special needs and prices. The bulk of the reclaim output, however, can be classified by the kinds of scrap used as follows: inner tube, whole tire, tire carcass, solid tire, boot and shoe, and mechanical blends. In the nature of the case there can be only a rough approximation in the quality of the stocks produced by different reclaimers from the same types of scrap. Such correspondence in quality results from the average nature of the very large batches of ground scrap of each type and the use of the same general reclaiming treatment.

The very close and continuous uniformity in chemical and physical characteristics maintained by every reclaimer in his regular grades is particularly worthy of note. The reason for this uniformity is due: first, to the care exercised in grading the scrap from any given source as to its original quality, color, gravity and depreciation by oxidation; second, in the general average of the finely ground scrap all differences disappear; third, every stage of the processing is standardized and checked by laboratory control of each batch in process and by curing tests on the final product before shipment.

Type Reclaims

The data in the following table represent three principal types of reclaim, each selected from a different manufacturer's test. It should be noted that these figures denote quality above the average. They are, in effect, maximum, but judgment on any reclaim should include consideration of its milling and plastic quality, its effect on make-up, service qualities and cost of the goods.

TABLE I

TYPE RECLAIMS

	Rubber	Extract	Mineral	Gravity	Tensile	Elongation
Tire	66.0	7.5	24.0	117	1,650	550
Tube	80.5	10.5	5.5	98	1,000	300
Shoe	40.0	8.0	49.0	160	450	300

Selection of Reclaims

The factors to be considered in the choice of reclaim for rubber mixing are economy and quality. By economy is meant cost on a volume basis. Pound cost never coincides with volume cost except in the case of materials of unit gravity. In a former article[2] the importance was shown of considering the volume cost of every ingredient and the finished mixing in order to establish its actual economy.

Workability and service are the final proofs of quality. These factors can be ascertained by laboratory tests. How diversified a list of reclaims should be stocked depends on the variety, cost and grades of the rubber products made. For most factories the list will include one or more of several tire and tube reclaims selected with regard to cost, rubber content, color and gravity, also shoe reclaim and a group of specials for use in compounding to meet particular requirements in color, etc.

Whatever types of reclaims are stocked the chief reason for their use is the economy they afford by their substitution for crude rubber. This saving is limited by the workability of the mixing and the reasonable serviceability of the finished products at the price. Compounders of earlier years were often at a serious disadvantage in using reclaims owing to limited knowledge concerning their quality. This handicap no longer exists due to the improved and constant quality of the reclaims now available. Concerning all of their stocks reclaimers furnish test data and recommendations for use based on laboratory tests.

Weight and Volume Data

The usual analytic data given by reclaimers included the weight percentages of rubber content, acetone extract (non-rubber organic matter consisting of resins, oils, etc., classifiable as softeners), mineral matter (for the most part inert fillers), and total sulphur. This is supplemented by gravity, tensile strength, and elongation at break.

 Continued from THE INDIA RUBBER WORLD, March 1, 1927, pp. 313-314.

[2]THE INDIA RUBBER WORLD, January 1, 1927, pp. 189-190.

For closer control of compounding it is necessary to consider each reclaim as a rubber mixing by itself and convert the above listed analytic data from weight percentages into corresponding volume percentages. It will then be possible to regulate, as regards the reclaim employed in a rubber mixing, the rubber equivalent and mineral added both on a weight and volume basis.

This detail is as desirable concerning the reclaim as of any other compounding ingredient. By way of illustration Table 2 shows volumetric data for the reclaims given in Table 1.

TABLE 2

CORRESPONDING WEIGHT AND VOLUME DATA

Type Reclaim		Rubber	Extract	Mineral	Gravity	Tensile Lbs. Per Sq In.	Elongation Per Cent
Tire	Wt.	66.0	7.5	24.0	117	1,650	550
	Vol.	84.2	8.9	5.6			
Tube	Wt.	87.5	6.0	5.0	98	1,000	700
	Vol.	93.5	5.9	0.6			
Shoe	Wt.	40.0	8.0	49.0	160	450	300
	Vol.	70.0	8.0	22.0			

A table of this sort should be extended to include every reclaim used. But the tendency to multiply reclaims should be repressed with the view of reducing inventories and simplifying rubber mixings.

Sample Compounds

In current practice reclaims are used freely with full knowledge of their effect. The compounders have in mind the requisites of economy, practical conditions of processing, and the life and serviceability of the finished goods. A few practical compounds are appended as examples.

Reclaims in Current Practice

Concerning these representative stocks given above it should be noted that the proportions of reclaim to crude vary over a wide range, according to the service for which each is designed. The proportions range from 25 to 750 per cent as follows: first tread, 50 per cent; second, 75 per cent; inner tube, 30 per cent; friction, 41 per cent; code wire, 360 per cent; boot upper, 25 per cent; heel, 750 per cent; hose tube, 380 per cent.

Proportions such as these of reclaim to crude are compatible with satisfactory service only when the stocks are suitably reinforced, stabilized and accelerated. Also the reclaims selected must be the best of their types.

The most advanced practice in making high tensile stocks such as tire treads is to reinforce them by adding 40 per cent of gas black on the crude rubber and 10 per cent on the tire reclaim, especially if the latter is used in large proportion. Further this presence of reclaim in no way debars the use of stearic acid or selenium to promote cure and abrasive resistance.

In the case of inner tubes containing reclaim and tire frictions the preferred method is to utilize thermatomic carbon instead of ordinary gas black because of the slight effect produced by thermatomic on the plastic quality of the mixing. Its reinforcing effect is distinctly less than that of gas black. While reinforcement of tensile is desirable, plasticity is the more essential as a working quality. The use of reclaims in tires and inner tubes has increased greatly in the past few years without reduction in tire mileage. This result is attributable to several factors, namely; (1) improvement in the technical qualities of reclaims; (2) better appreciation of their economic value; (3) more scientific compounding with reinforcing pigments, anti-oxidants and practical low temperature accelerators. The latter particularly conserve the full teechnical qualities of reclaim unimpaired in the cure.

In all but a few lines of rubber goods, reclaims have always figured prominently, especially in boots and shoes, mechanical goods, topping, proofed goods, and molded specialties. In fact crude rubber is now reduced to a minimum and actually eliminated from mixings particularly, in many cases, when all consideration of quality must be set aside for competitive price. In designing mixings for competitive goods greater skill in compounding is often required than in the case of high grade and specification goods, because working qualities must be retained with as much semblance of quality as is consistent with price. In other words, the compounder must produce something practical when hedged about by exactions that closely approach incompatibility.

The future of reclaim in the rubber industry is replete with undeveloped possibilities. The reclaiming research chemist is improving reclaim processes and qualities while other chemists are developing new processes and uses for rubber in which advanced methods of compounding are appearing. Instances of these developments are compounding rubber latex, water dispersions of rubber and reclaim and electro deposition of rubber from pure and compounded rubber mixings containing reclaim.

Typical Compounds Containing Reclaims

TIRE TREAD

	Parts by Weight
Smoked sheets	100
Tire reclaim	50
Gas black	50
Zinc oxide	10
Hard hydrocarbon	10
Stearic acid	3
Accelerator	1
Sulphur	4
	228

Cure, 40 minutes at 40 pounds.

TIRE TREAD

	Parts by Weight
Smoked sheets	40.0
Tire reclaim	30.0
Hard hydrocarbon	5.0
Zinc oxide	7.0
Gas black	15.0
Sulphur	2.0
Accelerator	0.5
Pine tar	0.5
	100.0

Cure, 40 minutes at 40 pounds.

INNER TUBE

	Parts by Weight
Smoked sheets	68.5
Tube reclaim	21.0
Zinc oxide	6.0
Accelerator	0.5
Sulphur	4.0
	100.0

Cure, 45 minutes at 40 pounds.

TIRE FRICTION

	Parts by Weight
Smoked sheets	58.0
Tube reclaim	24.0
Hard hydrocarbon	4.5
Liquid asphalt	2.0
Zinc oxide	6.0
Sulphur	3.0
Accelerator	0.5
Magnesium oxide	2.0
	100.0

Cure, 40 minutes at 40 pounds.

CODE WIRE INSULATION

	Parts by Weight
Smoked sheets	10.000
Tire reclaim	36.000
Whiting	20.000
Litharge	5.000
Hard hydrocarbon	30.000
Stearic acid	1.000
Sulphur	1.625
Accelerator	0.375
	104.000

Heater cure, 30 minutes to rise to heat, followed by 90 minutes at 240 degrees F.

BOOT UPPER

	Parts by Weight
Smoked sheets	50.00
Tire reclaim	12.50
Gas black	22.50
Zinc oxide	5.00
Mineral rubber	5.00
Coal tar	1.50
Anti-oxidant	0.75
Accelerator	0.50
Sulphur	2.25
	100.00

Cure, 60 minutes at 240 degrees F.

HEEL—COMMERCIAL QUALITY

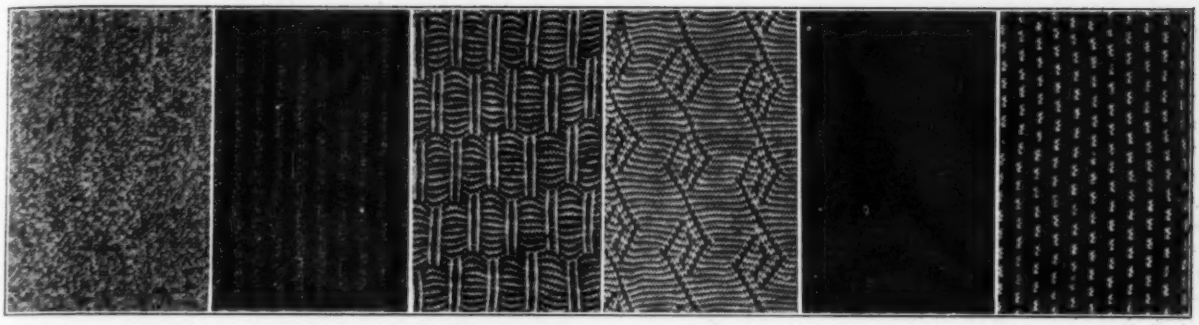
	Parts by Weight
Rubber	8.00
Tire reclaim	60.00
Mineral rubber	5.00
Clay	20.00
Zinc oxide	3.00
Gas black	5.00
Accelerator	0.25
Sulphur	1.50
Stearic acid	1.00
Petrolatum	2.00
	105.75

Cure, 12 minutes at 60 pounds.

HOSE TUBING

	Parts by Weight
Smoked sheets	10.5
Truck tire reclaim	45.0
Hard hydrocarbon	11.0
Clay	30.0
Litharge	1.5
Sulphur	2.0
	100.0

Cure, 60 minutes at 45 pounds.



MOCK TWIST SILK AND WORSTED FIGURED NET FANCY NET BROWN NET BLACK AND WHITE

Types of Fancy Patterned Cloths in the 1928 Gaiter Line

The Millinery Vogue in Footwear

Fancy Fabrics for Gaiters—Knitted and Woven Materials—Silk, Cotton and Wool Mixtures—Footwear Manufacturing Problems

UNTIL a year ago, the rubber footwear purchasing agent's worries on overshoe fabrics were confined to two or three grades of black materials. With the advent of tan and grey overshoes last fall, and the addition of many varieties of fancy patterned cloths in the 1928 line, the style department, the chemical laboratory, and the buyer have faced many problems to secure the effects in gaiter cloth which would satisfy the sales department and at the same time be properly constructed for rubber shoe manufacture.

Evolution of Gaiter Fabrics

In tracing the evolution of gaiter fabrics from the standard types of many years ago, it would perhaps be well to describe briefly the long accepted grades. Knitted fabrics have always had first call for gaiter work on account of their appearance, durability, and general adaptability to the conditions of manufacture. The stretch in the knitted fabric permits the shoe maker to shape it to the last perfectly. Formerly all light overshoes were made of all worsted jersey cloth, knitted from pure Australian French-spun yarns, double thread construction, the yarns being either 50's or 60's. The pieces were knit in tubular form on 27 to 30-inch heads with a drop stitch to furnish a cutting line for slitting the goods into flat pieces after dyeing, making the finished width 52 to 54 inches, thus affording full width for the rubber coating calenders. These cloths are similar in construction to the materials from which jersey dresses are manufactured for the women's dress trade.

For the men's heavy arctics and gaiters woven cloths known as cashmerettes have been widely used. While not as pliable as the jerseys these cloths were made with a slight stretch and worked well on the men's lasts which did not have the curves and contours of the more closely fitting women's overshoes.

Dyeing was not much of a problem in the old days, as the woolen goods could be dyed with a logwood or chrome black and made proof against crocking without difficulty. The dyeing problem on cotton fabrics will be discussed later.

The first change in gaiter fabrics came several years ago when the low priced overshoe, made from all cotton fabric, was put on the market. The first fabric used was a 54-inch, 1.55 warp sateen, and while the fabric was satisfactory from an abrasive wear standpoint, some difficulty was encountered in getting a black dye which would retain its color and fastness under the severe conditions which the outside of an overshoe encounters. Sulphur blacks proved objectionable owing to their tendency to turn green and make the fabric weak if the dyeing process was not done with exact care. Developed blacks with after treatment were then resorted to and proved the most satisfactory.

Cotton Knitted Fabrics

Once the cotton cloth gaiter became established, efforts were made to find a fabric which would be more presentable in appearance than the woven sateen. It was natural that the shoe manufacturer should turn to the cotton knitted fabrics he was already using for gum shoe linings. These are made from both karded and combed cotton yarns, in both double and single thread construction, in weights from 5 ounces per square yard to 11 ounces. Double thread construction has always been used in the quality shoes, just as it was preferred in the worsted jersey cloth. The reason for this on an outside gaiter cloth, is that the shoe is subject to considerable scuffing and abrasion on the cloth, and in the double thread construction, if one thread breaks, the other thread will prevent the cloth from giving way and unraveling.

In a rubber lining considerable flexing action is present across the vamp and experience has shown that double thread linings have less tendency to crack at this crucial point. Of the general line of shoe nettings, the two lightest in weight known in the trade as 4½ and 6½, are made with two ends of 32's yarn and two ends of 45's yarn respectively, in the double thread, and in the single thread, of one end of 25's for the 4½ and one end of 50's for the 6½. The terms 4½ and 6½ refer to lineal inches per ounce but have long ceased to be accurate owing to construction changes. Neither of these fabrics approached the construction of the old worsted jersey which was made from 60's yarn. By increasing the number of stitches to the inch, however, the manufacturers found they could get a fabric which had weight enough for an outside gaiter cloth and was much better in appearance than the woven sateen cloth.

Fancy Woven Fabrics

The first tan gaiters which were brought out last year such as the Cambridge Raynboot and the Converse Bobbette were made with worsted jersey cloth of standard construction so that no particular dyeing problem was encountered. When rubber shoe manufacturers started experimenting with a full line of fancies, however, the knit goods line did not offer the variety of patterns and colors demanded by the sales department, and temporarily the mills were obliged to turn to woven fabrics. These were sampled in a wide range, from worsted tweeds, serges, flannels, cotton and wool mixed fabrics, made from noils with silk stripes, etc. Grey

and tan were the prevailing colors adopted to harmonize with the most popular dress colors.

While the knit goods manufacturers were not able to reproduce some of the fancy pattern effects of the woven goods, they started to experiment and in a short time came out with some very handsome fabrics in constructions which the rubber manufacturers could use to an advantage. One of the most popular types known as the "Mock twist," is made in the 4½ netting type by twisting a white yarn and a colored one together and then knitting the piece in the regular way. The result is a speckled effect which is very pleasing. These are now carried in most all of the fancy overshoe lines in brown and white and black and white, the latter giving a grey effect in the finished piece. Two kinds are on the market, one containing 75 per cent color and 25 per cent white, the other 50 per cent of each. These are also made in heavier weights with 16's merino yarn, cotton and wool mixed. This approximates the woven tweed.

Silk, Cotton and Wool Mixtures

Rayon and cellanese are being used in knitted fabrics in combination with wool and cotton. The artificial silk when knit with a brown or grey cotton or worsted yarn makes a very pleasing fabric for a woman's dress arctic. The cotton or wool form the body of the fabric and give it sufficient strength to overcome any objection of the wearing qualities of the silk. These shoes are made with a striped cuff to match the fabric in the body of the shoe. Some of the constructions used are 30's worsted yarn with 100 denier rayon; 34's merino cotton and worsted yarn with 100 denier rayon, both double thread; and 25's single merino with 75 denier cellanese.

Many fancy patterns are now being made in nettings by using stock dyed yarns and white yarns with drop and lock stitch effects. Some of the patterns are reproductions of fancy underwear designs which were popular thirty years ago and will be worn extensively next year on the outside of overshoes. In making these numbers, the trend has been toward small regular designs so that the figures will blend properly on the shoe. In making fancy nets it has been found that 20's yarn on 18 needles to the inch is the most practical weight, generally known in the trade as a 4½ net.

Velvets, velveteens, and velours, and other varieties of "pile" fabrics such as corduroys are being employed as cuff materials.

Complicated Manufacturing Problems

The innumerable problems which have confronted the rubber footwear manufacturers in getting these fabrics in shape to make their next season's goods have been present in the textile trade as well. Most of the manufacturers of these materials are doing business with the rubber footwear trade for the first time, and have had to change their methods of put up, lengths and widths of pieces, as well as dyeing specifications to meet rubberizing standards. In the calender and mixing departments it has required considerable experimenting to obtain compounds which will adhere properly to many of these fabrics, some of which have never been rubberized before. Spreading has been resorted to in many cases.

At the present time, facilities for stock dyeing yarns in the textile trade which caters to rubber footwear requirements are not extensive, but more units are being installed to meet the heavy demand for fancy fabrics. This method has opened the eyes of the rubber footwear manufacturers to the possibility of stock dyeing yarns in plain colors instead of dyeing in the piece. Experiments are now being conducted on a sulphur black dye by this method which will insure more uniformity of color and a more fast dye than has been possible hitherto. In the so-called stock dye, 10,000 pounds of yarn are put through the dye at one time, and naturally the color will show less variation than in dyeing 100-yard finished pieces one at a time.

While in one sense, the millinery vogue in footwear is complicating manufacturing problems, at the same time it is opening up new markets for rubber footwear and will undoubtedly contribute much increased volume before another year has passed.

Factory Research

P. A. Cady[1]

In their efforts to produce goods free from blemishes and capable of maximum service, rubber manufacturers realize the importance of maintaining high standards of physical properties, such as tensile strength, set, friction grip, and resistance to such factors as abrasion, heat, acid, alkali, flow under pressure, etc. Therefore all well organized and properly equipped plants test samples drawn from crude materials. It is recognized by all production supervisors that even high standard control tests are inadequate. It has long been conceded that there is a paramount need for practical methods of testing rubber products at intervals during the process of preparation and fabrication; to guarantee against occasional variation in physical properties and for protection against processing material which would at final inspection of the goods show blemishes and cause the goods to be rated as second quality.

While the need of material and process control is always present in factory operation its importance often is not recognized to the extent of organizing the work under a special department, but instead the work is made a part of the foreman's duty or a side issue of laboratory routine. In either case more duties are apt to center on these department heads than can be handled to the best advantage, particularly where the causes of trouble require to be ascertained by close study.

Thus in a large plant factory control and research become an independent department supervised by a technical man with technicians and men drawn from the various manufacturing departments. It functions independently of the laboratory and production departments and without bias serves as referee in matters relating to stocks, delays in production and all manufacturing difficulties. Its method of operation covers: first, general inspection of processes and contact with final inspectors of finished product, for detecting deviations from standards; second, it is a clearing house for all trouble reports sent to the laboratory or department managers as a result of difficulties of every nature arising during processing. As difficulties are reported a survey is made by men detailed to trace the causes. The use of practical as well as technical men in this work enables such investigations to be carried on to the fullest extent with the minimum interruption to production and this combination produces the maximum in results. The aim of each investigation is not only to determine causes but to devise methods of automatically indicating any recurrence of the trouble.

One of the results of this method is the development of a system whereby samples from each batch of stock for certain lines are cured and tested for color, hardness, specific gravity, physical strength, and stress strain behavior as the need may require, before its release for further processing. Very profitable results are secured by these tests, preventing continuance in production of faulty material, and the effect on the standard at final inspection and test of the goods has been noticeably improved.

This line of research has necessitated the development of thorough methods of sampling and rapid methods of preparation of samples and testing. It has resulted in combining with the existing system of procedure the necessary modification to cover the needs of such sampling, testing, rejecting or releasing, without materially increasing costs or interfering with smooth working of the plant as a whole.

A department of the character outlined affords the foremen and factory operatives a place where they can present their problems to men who understand and appreciate their difficulties, and viewpoints are interchanged to mutual advantage. The technical men are afforded a better contact with production problems.

Thus the factory research department becomes a clearing house on practical methods and processes. The data collected and correlated serve to answer perplexing questions on manufacturing problems.

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[1] Research Engineer, the Manhattan Rubber Manufacturing Co., Passaic, New Jersey.

Dealers' Tire Stocks — April 1, 1927[1]

THE final statistics as compiled by the Rubber Division, Department of Commerce, in its sixth semi-annual survey of dealers' stocks of automobile tires, indicates 36,865 dealers participating as compared with 32,184 for April 1, 1926, and 32,592 for April 1, 1925.

The accompanying tabulation shows larger figures for stocks of automobile tires and also, as compared with the records of a year ago, a greater number of dealers reporting and a larger average per dealer, the single exception being the figures for solid and cushion tires. The average number of casings per dealer is this year given as 70.6, as against 63.9 for April 1, 1926, and 62.2 for April 1, 1925.

The important feature this year in any analysis of the stocks carried is the fact that a much smaller percentage of the dealers hold stocks of less than ten tires, the figure this year being 16.57 per cent, as against a percentage for April 1, 1926, of 20.36. There is, however, as usual, a predominance of stocks of from 10 to 25 casings, the percentage of 28.48 differing little from that of last year at 28.32 per cent. Of the 36,865 dealers reporting, 8,439 carry stocks of from 26 to 50 casings, 6,489 have from 51 to 100, and 3,196 have from 101 to 200. It is interesting to notice that of the larger stocks 433 dealers are this year handling from 301 to 400 casings, as compared with only 294 last year, 596 dealers are carrying from 401 to 1,000 casings as against 436 dealers a year ago, while 204 dealers are now handling stocks of more than 1,000 casings as contrasted with 166 dealers reporting April 1, 1926.

Dealers' stocks arranged geographically show that New York State is in the lead as to the number of casings held, 201,247, followed by Pennsylvania, Ohio, California, Illinois, Texas, Missouri, and Michigan. Pennsylvania also ranks first in regard to the number of dealers, followed by Ohio, New York, and California. Last year Pennsylvania was reported as having the largest number of tires on hand, 163,689, followed by New York with 156,729.

Pennsylvania also leads this year in the number of solid and cushion tires carried, having 4,693 out of the total of 44,868, while New York follows with 4,680, California having 4,259 and Illinois 4,214. Pennsylvania also has, as last year, the largest number of dealers, 187, followed by New York with 149. On April 1, 1926, California outdistanced other states in the number of solid tires carried, 6,336.

Analysis of the reports this year shows that more dealers are

[1] Special Circular No. 1489, Rubber Division, Department of Commerce, Washington, D.C.

DEALERS' STOCKS OF AUTOMOBILE TIRES

	April 1, 1927			April 1, 1926		
	Number	No. Dealers Reporting	Average Per Dealer	Number	No. Dealers Reporting	Average Per Dealer
Total casings	2,604,432	36,865	70.6	2,056,472	32,184	63.9
Balloon casings	868,312	24,431	35.5	399,808	18,284	21.9
Inner tubes	4,370,989	36,146	120.9	3,839,799	32,112	119.6
Solid and cushion tires	44,868	1,817	24.7	50,230	1,866	26.9

DEALERS' STOCKS OF AUTOMOBILE TIRES BY STATES, APRIL 1, 1927

	Total Tires			Balloon Tires		Inner Tubes		
	No. of Dealers Reporting	No. of Tires on Hand	Average No. Per Dealer	No. of Dealers Reporting	No. of Tires on Hand	No. of Dealers Reporting	No. of Tubes on Hand	Average No. Per Dealer
Alabama	446	24,660	55.3	270	7,632	437	62,603	143.3
Arizona	205	10,402	50.7	136	4,044	200	17,683	88.4
Arkansas	424	19,069	45.0	253	5,806	419	37,653	89.9
California	2,013	163,388	81.2	1,456	55,520	1,948	234,322	120.3
Colorado	471	28,743	61.0	327	10,346	451	49,833	110.5
Connecticut	376	33,597	89.4	289	12,889	363	49,852	137.3
Delaware	60	4,746	79.1	45	1,853	59	7,814	132.4
Dist. of Columbia	67	8,112	121.1	52	3,105	64	11,268	176.1
Florida	484	56,719	117.2	351	26,184	483	92,206	190.9
Georgia	380	24,942	65.7	256	8,655	378	55,944	148.0
Idaho	259	13,371	51.6	183	4,796	250	23,797	95.2
Illinois	1,953	146,785	75.2	1,338	49,740	1,949	269,463	138.2
Indiana	1,215	83,260	68.5	888	28,678	1,189	139,882	117.6
Iowa	1,322	78,693	59.5	945	23,181	1,206	136,410	113.1
Kansas	1,077	70,903	65.8	760	21,401	1,056	117,155	110.9
Kentucky	472	29,799	63.1	290	8,970	466	66,789	143.3
Louisiana	416	25,079	60.3	248	5,998	403	50,386	125.0
Maine	432	24,071	55.7	277	7,618	437	36,593	83.7
Maryland	398	35,481	89.1	208	6,907	396	55,420	139.9
Massachusetts	942	99,999	106.2	702	36,461	952	148,166	155.6
Michigan	1,503	100,329	66.8	1,075	36,682	1,476	174,840	118.5
Minnesota	988	65,451	66.2	681	22,740	974	102,624	105.4
Mississippi	431	23,271	54.0	236	6,716	428	41,127	96.1
Missouri	1,231	106,480	86.5	740	34,907	1,219	237,820	195.1
Montana	342	20,379	59.6	265	8,670	329	31,515	95.8
Nebraska	643	44,932	69.9	212	13,521	642	75,439	117.5
Nevada	53	4,124	77.8	43	1,511	54	6,624	122.7
New Hampshire	213	12,612	59.2	156	5,052	212	20,379	96.1
New Jersey	757	50,920	67.3	512	19,242	731	89,505	122.4
New Mexico	177	9,506	53.7	113	2,729	147	15,477	105.3
New York	2,248	201,247	89.5	1,608	74,306	2,218	315,544	142.3
No. Carolina	567	32,634	57.6	316	9,652	552	56,826	102.9
No. Dakota	527	25,336	48.1	180	3,101	529	49,708	94.0
Ohio	2,296	185,026	80.6	1,529	56,068	2,234	249,194	111.5
Oklahoma	695	54,273	78.1	476	18,547	684	65,436	95.7
Oregon	510	36,727	72.0	388	12,039	494	59,891	121.2
Pennsylvania	2,918	189,391	64.9	1,909	69,032	2,853	290,988	102.0
Rhode Island	156	11,309	72.5	101	3,568	157	17,205	109.6
So. Carolina	304	10,054	33.1	168	3,108	307	23,843	77.7
So. Dakota	477	19,911	41.7	331	6,550	468	36,588	78.2
Tennessee	419	32,010	76.4	240	9,537	414	59,458	143.6
Texas	1,750	116,018	66.3	1,147	32,751	1,729	219,378	126.9
Utah	204	13,781	67.6	140	5,052	197	20,982	106.5
Vermont	223	8,630	38.7	143	2,928	224	13,984	62.4
Virginia	798	38,356	48.1	424	9,896	802	81,440	101.5
Washington	793	52,515	66.2	550	20,840	783	78,332	100.0
West Virginia	570	33,837	59.4	326	11,394	550	55,174	100.3
Wisconsin	1,222	89,871	73.5	877	28,317	1,206	143,593	119.1
Wyoming	118	6,405	54.3	87	2,079	118	10,619	90.0
Unallocated	320	27,278	85.2	184	7,993	309	64,217	207.8
Total	36,865	2,604,432	70.6	24,431	868,312	36,146	4,370,989	120.9

DEALERS CLASSIFIED BY VOLUME OF STOCK

	April 1, 1927			April 1, 1926		
No. of Casings	Number of Dealers	Per Cent of Total Dealers	Number of Casings	Number of Dealers	Per Cent of Total Dealers	Number of Casings
Less than 10	6,106	16.57	31,124	6,552	20.36	32,271
10—25	10,498	28.48	177,940	9,114	28.32	154,149
26—50	8,439	22.89	309,113	7,076	21.99	261,077
51—100	6,489	17.60	447,533	5,259	16.34	391,028
101—200	3,196	8.67	446,622	2,559	7.95	355,642
201—300	904	2.45	221,233	728	2.26	179,007
301—400	433	1.17	151,837	294	.91	103,113
401—1,000	596	1.62	363,857	436	1.35	266,381
Above 1,000	204	.55	455,173	166	.52	313,804
Total	36,865	100.00	2,604,432	32,184	100.00	2,056,472

NUMBER OF MAKES HANDLED

	April 1, 1927		April 1, 1926		April 1, 1925	
No. of Makes	No. of Dealers	Per Cent of Total	No. of Dealers	Per Cent of Total	No. of Dealers	Per Cent of Total
One	17,594	47.9	12,994	42.0	13,902	43.2
Two	13,790	37.5	11,576	37.5	11,675	36.3
Three	3,779	10.3	4,317	14.0	4,509	14.0
Four	1,078	2.9	1,402	4.5	1,401	4.3
Five	361	1.0	465	1.5	478	1.5
Six	148	0.4	170	0.5	217	0.7
Total	36,750	100.0	30,924	100.0	32,182	100.0

DEALERS' STOCKS OF SOLID AND CUSHION TIRES

	Number of Tires	No. of Dealers	Average per Dealer
April 1, 1926	50,230	1,866	26.9
April 1, 1927	44,868	1,817	24.7

concentrating their sales efforts on one make of tires than in preceding years, 17,594 dealers, or 47.9 per cent of the total being represented in the present survey as against 12,994, or 42 per cent for April 1, 1926, and 13,902, or 43.2 per cent for two years ago. The percentage however of dealers handling two makes of tires remains unchanged from the figure of a year ago, 37.5, the record for April 1, 1925, being 36.3 per cent. The general tendency seems to be toward specialization, and, although handling other lines of goods, a larger proportion of dealers report this year that tires constitute their major sales.

A total number of 37,818 dealers sent in reports this year regarding lines of business maintained in addition to sales of tires, the record for April 1, 1926, being 33,440 dealers. Of these 6,186, or 16.4 per cent of this year's total, reported tires as constituting their major sales, the figures for a year ago including a total of 5,328 dealers, or 15.9 per cent. Dealers selling automobiles, gasoline, batteries, and tire repair materials in addition to tires are estimated this year at 14,164, 27,481, 19,746, and 24,880 respectively. Dealers repairing inner tubes and also maintaining vulcanizing equipment are recorded at 22,316 and 4,827 respectively.

California Botanical Gardens

Dean Merrill Heads Thousand-Acre Southwest Project for Cultivation of Rubber and Other Plants

Dr. E. D. Merrill

THE appointment of Dr. E. D. Merrill, dean of the College of Agriculture of the University of California at Berkeley, as director-general, and the setting to work of a force of workmen, marks the actual beginning of the long-projected California Botanical Gardens near Los Angeles, designed to be the largest and which may become the most important of the world's horticultural institutions.

Of particular interest to the rubber industry is the fact that there will be grown and scientifically studied with a view to their adaptation to American soil every available rubber tree, shrub, vine, and plant of the tropics, sub-tropics, and parts of the temperate zones outside the United States, thus supplying a service similar to that of the Royal Botanic Gardens, Kew, England, and which resulted in the establishment of the British rubber plantations.

The gardens will be situated in Mandeville Canyon in the Santa Monica Mountains close to the cities of Santa Monica and Beverly Hills, and adjoining the new sites of Occidental College and the Southern Branch of the University of California. A tract of 3,500 acres has been secured, of which 2,500 acres on rising ground surrounding the gardens will be laid out as a residential park. From the sale of fine homesites it is estimated that about $5,000,000 will be realized, which with national, state, and other endowments will provide an ample fund with which to establish and maintain the project. Arrangements have already been made for a bond issue to supply money required for preliminary operations.

A Uniquely Favored Location

Out of the tract will be reserved 800 acres and to this will be added by gift the noted sub-tropic Oakley gardens at the mouth of the canyon, 200 acres, making 1,000 acres (as compared with Kew's 400) to be used solely for the gardens. Provision will be made for plant introduction, experimental, and quarantine stations, arboretum, plant propagation section, herbarium, library, laboratories, conservatories, etc., and the division of research, including biology and genetics.

No place in the country appears to offer so many favorable factors for such a botanical enterprise. The location affords level bottoms, high mesas, mountain sides, and a ridge, and altitude range from 75 to 2,800 feet above sea level. Sheltered from north winds, the canyon has a climate varying from highly humid to semi-arid, and the remarkable collection of native flora attests the desired quality and variety of soil. The available land is four and one-half miles long.

Among those who have visited the site and given the project unqualified approval are Dr. A. W. Hill, director of the Kew Gardens; Dr. H. A. Gleason, of the New York Botanical Gardens; Dr. Harvey M. Hall, representing the Carnegie Institution, and Mrs. Charles W. Wallcott, Smithsonian Institution, Washington. Cordial encouragement and offers of aid have also been received from Secretary of Agriculture William M. Jardine, Director George H. Hecke of the California department of agriculture, and the directors of the London, Edinburgh, Berlin, and Missouri botanic gardens. Much credit is due to Dr. George P. Clements, head of the agricultural department of the Los Angeles Chamber of Commerce, who has worked on the plans for many years and who has enlisted the active support of the federal government and other powerful agencies, and to H. C. Oakley, who has agreed to donate his fine estate.

Director Is Noted Authority

Dean Merrill is regarded as a leading authority on botany and related plant sciences. After his graduation from the University of Maine in 1898, he took up work with the United States Department of Agriculture. In 1902 he went to the Philippine Islands as government botanist, and during the twenty-two years he spent there he made one of the largest collections of botanical books and materials ever gathered in Asia.

It is understood that while great efforts will be made to modify the habits of the most prized rubber-bearing trees of the tropics so that they may conform themselves, as some tropical trees have done, to conditions obtaining in the frostless and fairly humid sections of the country, especial attention will be early directed to the cultivation and improvement of guayule, the tall milkweed *Asclepias subulata*, *Chrysothamnus nauseosis*, cactus-like *Euphorbias*, and other varieties of native southwestern rubber-bearing plants that give promise of ready growth, easy harvesting, and potential usefulness.

JAPAN'S EXPORTS OF RUBBER TIRES DURING FEBRUARY, 1927, WERE valued at 200,000 yen, the figure rising for March to 400,000 yen. The value of the yen in March reached a high point, $0.4925.

Measurement of the Abrasion Resistance of Rubber[1]

Ira Williams[2]

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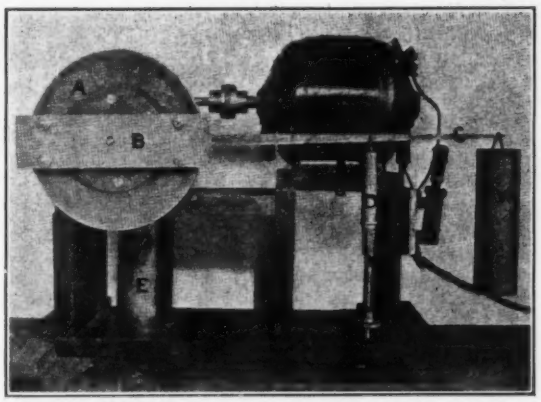


Apparatus for Measuring Abrasion Resistance of Rubber

THE purpose of the measurement of the resistance to abrasion of a rubber compound is to determine the life in actual service of an article produced from the rubber. This may be done either by interpreting the results obtained with an abrasion machine directly into service or by comparison with a second compound of known service life. The reliability of the test depends upon the extent to which the particular abrasion machine duplicates actual service conditions. This at once raises a question in regard to the type of abrasion machine to be employed and requires a knowledge on the part of the operator, not only of the peculiar action of the abrasion machine, but of the detailed stresses, strains, loads, conditions of slip, temperature, etc., imposed upon the article during service. The lack of this detailed information explains much of the lack of confidence in the results obtained by any particular abrasion machine and is sufficient reason for placing final reliance only on actual service tests.

Varieties of Abrasion Machines

Attempts to duplicate service conditions are responsible for the existence of a large variety of abrasion machines which in the final analysis are seen to be quite similar. Each machine gives due consideration to the abrasive, the area of rubber exposed, the pressure between abrasive and rubber, and the duration of the test or the amount of slipping, apparently on the assumption that the only remaining variable is the rubber itself. The mechanical differences in the abrasion machines arise largely from the different methods employed to produce slipping between the rubber and abrasive, and from this standpoint the various machines may be divided roughly into three classes.

1. A flat rubber surface is moved against a flat abrasive surface in the same plane. The area of the rubber exposed to the abrasive is usually maintained constant in all tests and is pressed against the abrasive by a standard pressure. The test is usually conducted for a standard time at a fixed speed.

2. The rubber, either a prepared disk or blocks attached to the periphery of a wheel, is rotated against a rotating abrasive surface, the two axes of rotation being neither perpendicular nor parallel. The amount of sliding action between the rubber and abrasive is determined by the relative position of the two axes. The load is maintained constant while the area of contact may remain constant or may increase, depending on the shape of test piece and the relative position of the axes. The test is usually conducted for a standard time at a fixed speed.

3. The rubber is subjected to the impact of loose abrasive. The usual procedure consists in rapidly rotating a disk of rubber in a vessel of loose abrasive.

Principle of Abrasion

Abrasion seems to be the process of wearing away the surface by friction and is an action which in itself involves only the surface layer. Motion between the rubber and the abrading surface is necessary and a force must be applied to create the motion. The product of this motion and force represents the amount of work which is actually done on the surface of the rubber. The uniform conditions of surface contact, load, and amount of slip which are generally imposed on the test sample do not assure the expenditure of a uniform amount of work, which under these uniform conditions is a direct function of the resistance to motion which the rubber exerts. This factor, which has formerly been neglected, may differ as much as 100 per cent between two samples of rubber. Since the surface of the rubber can be removed only by the application of work, the measurement of volume loss on abrasion is incomplete without a simultaneous measurement of the total work expended on the rubber.

Apparatus

The accompanying picture illustrates an abrasion machine for measuring the volume loss of rubber per unit of work expended. The principle is that of a Prony brake in which the rubber test pieces are made the friction surfaces of the brake. The disk *A*, carrying the abrasive, is mounted on a hollow shaft and rotates in a vertical plane at a speed of 37 r. p. m. Two rubber test blocks, each 2 cm. square and 1 cm. thick, are mounted on the under side of the bar *B*, one being placed at each end and at a distance of 4.5 inches (11.4 cm.) apart. The bar *B* is permanently attached to a rod which extends through the hollow shaft carrying the abrasion disk. A weight *E* attached to the end of this rod by means of a cord over a pulley holds the test pieces against the abrasive. The lever arm, *C*, carries at the end an adjustable weight which is made just great enough to prevent the rotation of the bar *B*. This weight varies from 500 to 1,000 grams. The spring balance, *D*, serves for the final adjustment of the load. The abrasive generally used is No. 0 emery paper. The abrasive surface is cleaned by means of air jets which are not shown. Brushes are not efficient. This machine measures the volume loss in the usual manner which, together with the simultaneous measurement of rate of work, permits the calculation of volume loss per unit of work done.

Calculation

The calculations necessary for the calibration employ the ordinary Prony brake formula,

$$\text{H. P.} = \frac{2\,NRW}{33{,}000}$$

[1] Published by courtesy of *Industrial & Engineering Chemistry*.

Presented under the title "The Measurement of the Abrasion Resistance of Rubber and Some Relations between Abrasions and Treadwear," before the Division of Rubber Chemistry at the 73rd Meeting of the American Chemical Society, Richmond, Virginia, April 11 to 16, 1927.

[2] Industrial Fellow, Mellon Institute of Industrial Research, University of Pittsburgh, Pittsburgh, Pennsylvania. The data presented in this paper were secured during the course of an extended investigation of accelerators and of vulcanization, which was sustained by the Grasselli Chemical Company of Cleveland, Ohio, during the period 1923-1927.

where N = r. p. m. of the disk carrying the abrasive
R = distance expressed in feet from the axis of rotation to the weight tending to prevent rotation.
W = weight in pounds applied to prevent rotation.

It is obvious that three calculations will be necessary. First, the work represented by the weight of the lever, *C*, with the Vernier balance, *D*, attached but hanging free. The factor, *W*, in this calculation can be obtained conveniently by supporting the lever with a spring balance. The weight indicated by the balance is *W*, and the factor, *R*, is the distance from the axis of revolution to the point at which the lever was supported. The work indicated by this calculation will be constant in all tests. In the second calculation *W* is the weight applied at the end of the lever and *R* is the distance from the axis of revolution to the point of application of the weight. A table or curve can be constructed showing the horsepower corresponding to any weight *W*. In the third calculation *W* is the load indicated on the spring balance and *R* is the distance to the point of application of the balance. A table or curve can also be constructed showing variations of horsepower with variation of load indicated by the balance. The rate of work during any test will then be the sum of these three factors. Volume loss per horsepower-hour can be found by means of the formula $V = \frac{L \times 60}{\text{h.p.} \times T}$ where L is the volume loss during test and T is the duration of the test in minutes.

In order to illustrate the action of the abrasion machine, five tread-type compounds have been prepared. The compounds tested are shown in Table 1. Compounds 1 and 5 were milled first. Compounds 2, 3 and 4 were then prepared by mixing together the proper proportions of compounds 1 and 5. The abrasion data are shown in Table 2. The abrasion test was made with an 8-pound (3.6 kg.) weight holding the test blocks against the abrasive.

TABLE 1—COMPOUNDS TESTED

	No. 1	No. 2	No. 3	No. 4	No. 5
Smoked sheet	100.0	75.0	50.0	25.0	0.0
Tire reclaim	0.0	25.0	50.0	75.0	100.0
Zinc oxide	10.0	9.75	6.5	4.75	3.0
Carbon black	39.0	31.65	24.5	17.25	10.0
Stearic acid	0.0	0.37	0.75	1.13	1.5
Pine tar	0.0	0.50	1.0	1.5	2.0
Sulphur	3.1	2.87	2.65	2.43	2.2
Accelerator	1.00	1.00	1.00	1.00	1.0

The rate at which work is done on the test samples is seen in Table 2 to fall gradually from 0.0206 horsepower (15.4 watts) for compound 1 to 0.0136 horsepower (10.1 watts) for compound 5. This means that in equal periods of time only 66 per cent as much energy is expended on sample 5 as on sample 1. If only volume loss in equal periods of time is considered, compound 5 is shown to have 36 per cent as much resistance to abrasion as compound 1. When reduced to volume loss on the basis of equal energy expended, the resistance of compound 5 is only 23 per cent that of compound 1. These compounds by no means illustrate the extreme variations which may be met in rate of work. Compounds have been tested which vary in rate of work from 0.0083 to 0.0221 horsepower (6.2 to 16.4 watts).

Operation of the Machine

The rate at which work is done during a single test decreases slowly as the test progresses. Adjustment for this change is made by changing the tension in the spring balance, and readings must be taken at intervals which will permit an average value to be obtained. If the points form an irregular curve when plotted against time, the average is best obtained by means of a planimeter. If the curve is regular, a sufficiently accurate average can generally be obtained by inspection.

The abrasion machine may be operated in still another manner. Instead of subjecting the abrasion blocks to a uniform load and measuring the rate of work, it is possible by varying the load during the test to do work at any predetermined rate on the rubber. The series of five tread stocks were tested in this manner. The weight, *W*, and the balance, *D*, were adjusted to produce a rate of work of 0.0180 horsepower (13.4 watts). As the energy consumed tended to decrease, shot was poured into the hollow weight, *E*, until the rate of 0.0180 horsepower was maintained. The data are given in Table 3. In this case the relative value of the stocks will be the same whether considered on a volume-loss basis or on volume-loss per horsepower hour, since work was done at the same rate on all samples. The results are in good agreement with the figures given in Table 2.

TABLE 3—ABRASION TESTS AT AN EQUAL RATE OF WORK

Sample	Time Tested Minutes	Volume Loss on 20-Minute Basis Cc.	Loss		Value with Sample 1 as Standard
			Cc./h.p. Hour	Cc./k.w. Hour	
1	20	1.88	312	420	1.0
2	20	2.46	410	550	0.77
3	20	3.45	573	718	0.55
4	15	5.06	842	1,128	0.37
5	10	8.90	1,480	1,990	0.21

Other Factors Affecting Tread Wear

Work due to rolling friction is caused by the difference in circumference of the tire at the center of the tread and at the tread shoulder which necessitates slip, and by the change in area of the inflated tire when it deflects to carry the load. The amount of work will depend on tread design, on the coefficient of friction between the rubber and road surface, on the stress-strain relationship, and on the mechanical efficiency of the rubber. Under normal conditions both slip and strain in the rubber result. Any point on the tread of a tire at the time of coming into contact with the road will slip until the pressure against the road increases to a definite value, which depends upon the existing coefficient of friction and the stress-strain relationship of the rubber, after which energy is stored in the rubber due to the strain imposed. As the rolling motion of the tire proceeds until the point of the tread is about to leave the road, any energy stored in the rubber due to strain will be available to cause slip and do work on the surface of the rubber.

With zero coefficient of friction no slipping would occur or work be done on the surface. An infinitely great coefficient would allow no slippage but stress due to the resistance of the rubber would be stored in a reversible manner.

Many of these factors are extremely variable under road conditions and tend to be minimized by dusty or wet roads which reduce the friction. While the work done on the rear tires due to driving force and on the front tires due to steering thrust must be constant for any tread stock, the work due to rolling, camber, and toe-in will vary with the road conditions and tread compound. While the present development of the abrasion machine makes possible a comparison of the abrasion resistance of any compound, it should not be expected to replace actual road tests in the selection of a tire tread.

TABLE 2—ABRASION TESTS UNDER EQUAL LOADING

Sample	Loss in Weight Grams	Sp. Gr.	Volume Loss Cc.	Time Tested Min.	Weight Applied Grams	Spring Balance (Av.) Grams	Watts	Power H.p.	Loss		Value with Sample 1 as Standard on Work Basis	Value on Volume Loss Per Hour
									Cc./h.p. Hour	Cc./k.w. Hour		
1	2.413	1.100	2.193	20	580	600	15.4	0.0206	319	914	1.0	1.0
2	2.788	1.153	2.420	20	580	445	13.9	0.0187	388	454	0.82	0.91
3	3.439	1.207	2.850	20	462	425	12.0	0.0161	531	690	0.60	0.77
4	4.956	1.259	3.941	20	382	405	10.7	0.0143	826	1,074	0.39	0.56
5	6.006	1.315	6.09	15	363	380	10.1	0.0136	1,380	1,794	0.23	0.36

Starch in the Rubber Industry

Various Starches Used — The Electric Finish — Preferred Types of Potato Starch — Curing Starch Finished Goods — Importance of the Solvent — Proofing Developments

S. G. Byam

E. I. du Pont de Nemours & Co., Fairfield, Connecticut.

PERHAPS the outstanding material used for surfacing rubber coated fabrics is starch, though many other materials have always been employed for this purpose as well. We ordinarily think of starch as used principally for the sizing of warps in the textile industry or as being an essential ingredient of various adhesives. This is natural, of course, for these applications require more starch than any others. The employment of starch is of long standing in the proofing trade because it has filled a particular need quite satisfactorily. Rubberized fabrics are normally sticky and tacky when made and must be surface treated in some way to make them suitable for almost any purpose other than adhesive tapes. It has been customary, therefore, to dust these surfaces with some powder. Starch ably performs the fundamental function of removing the tack and in addition produces a pleasant feeling and, under proper conditions, a fine appearing surface.

Types of Starches

The starches used for this purpose are chiefly corn and potato, though sago, tapioca and certain mixtures also produce desirable effects. Wheat, rice and other starches are not used much for this purpose because they seem to produce no features that are different or more desirable than the corn and potato starches. In this connection we say "seem to produce, etc.," advisedly, as the proofing trade has only recently started on development and research work of a worthwhile nature and it is quite possible that other starches than the old familiar corn and potato starch may be made to serve for some now unthought of attractive finish for rubberized fabrics. It is perhaps generally known that corn starch produces a dull smooth surface on rubber which finishes it admirably for hospital sheetings, apron fabrics, certain types of raincoat cloths, and many other purposes. This dull finish is simple to apply and only ordinary skill is required to keep it from streaking or blotching, regardless of varying conditions of rubber application or type of cure. The corn starch finish is the "old shoe" of the rubberizer because it is comfortable and safe.

Electric Starch Finish

However, the trades using the rubberizers' products and our friends, the consuming public, demand something different and more attractive than this dull appearance, and the potato starch finish has at various times in the history of this industry filled the requirement. We are now, perhaps, at the end, or nearly so, of one of the greatest demands for the "electric" or potato starch finish the raincoat trade has ever known, and it is the second run this finish has had during the last dozen years. It seems as true in this case as in many others that history repeats itself and that there is nothing new under the sun. Surely the potato starch, high luster, electric, or whatever you may call it finish was not developed for the first time to meet the exceptional demand existent during the past two years; it had been used extensively before. This finish is more difficult to manipulate successfully than the corn starch type, as any rubberizer will admit, principally because streakiness, variation and spotting are so likely to happen. Conditions can be arranged to eliminate a great part of these unsatisfactory results, but a thorough knowledge of compounding, spreading, starching, brushing and drying operations must be available. Too soft a compound, instead of making more starch adhere to the surface, may cause so great an absorption of starch from the surface that a dull and not bright finish results. On the other hand, too hard a compound is quite likely to produce a surface which will retain so little starch from the dusting operation that the desired brilliant finish does not materialize. Starch that is damp will doubtless streak badly when applied to the rubber, and improper feeding the starch to, and brushing it from, the surface will surely cause an unsightly and unsalable product as the result.

These conditions happily are controllable to a large extent, and it is to be noted that rubberizers themselves have agreed, which is rare, that as a group they will not guarantee this finish to their trade against streakiness, shading, spotting and similar surface variations. With all this, however, the soft brilliance and charming effect obtained by applying the potato starch over highly colored rubber coatings so caught the young public's fancy that approximately fourteen million yards of cloth with this finish were produced and made into raincoats during 1926.

Preferred Types of Potato Starch

Probably no better potato starch exists than that produced in Aristook County, Maine, and if we could consistently obtain a supply of the best "prime Aristook" we would ask for no other. It is equally true that from a practical standpoint an imported starch is preferred, this material coming from Holland or Germany. The advantage of the imported product for the proofer's use lies as indicated in its uniformity. It is understood that whereas the principle of making starch is the same in every country the methods are entirely different. The best starch is made from selected potatoes, no rottens, culls, or undersized potatoes being used. Every step in the production of good starch from washing in filtered water, through thermostatically controlled drying and elimination of undersized starch granules should reflect the careful scientific control of the laboratory. The high luster of the finish, as we know it, depends upon its quantity of large granules and the effect of the sulphur chloride used for curing. The cured finish is brighter and more permanent than the uncured.

Preferred Curing Methods

The cure used in completing the rubberized fabric has an important bearing on the finish, for although dry heat or liquor sulphur chloride are suitable for cornstarch dull finishes, they are not, without modification, suitable for the electric potato starch finish. This electric luster finish usually is made with the vapor sulphur chloride cure. It is claimed, however, that the finish can be made more uniformly and with more permanence by combining a light continuous vapor cure with a completing and thorough liquor cure. The sulphur chloride in vapor form touches the starch and anchors it firmly to the rubber while the following treatment of sulphur chloride, diluted with suitable solvent, washes off only the excess starch and thoroughly cures the rubber coating. The method has seemed to work out excellently with some manufacturers, but has not come into any general use. It is doubtless true that either the single vapor cure or the double vapor-liquor cure will produce admirable results in the hands of any able proofer who is skillful

enough to keep his many other contributing conditions intelligently controlled.

Importance of the Solvent

It has been mentioned in a previous article[1] that solvent plays an important part in the proofing industry, not only because of its initial function of reducing compounded rubber to plastic form but because of its effect on the coating itself and the finish. Gasoline is the chief solvent used in this industry because of its low price and general suitability and because benzol, which it supplanted some years ago, is too poisonous. The grades of solvent used range from V. M. P. through motor gas to the so-called "sweet naphtha," which is usually a 68-72 degree or higher cut.

It is essential to have a solvent with a clean smelling residue, or perhaps we should say that the residue should not contain an abundance of sulphur or other chemical which will cause a noticeably unpleasant odor. This residue may remain in the rubber coating and tends to cause decomposition or at least an unpleasant smell. Double coated hospital sheetings have been known to give off such odors after standing in stock in paper covered rolls for some time, causing a most unfavorable impression on the consumer if not actual harm to the material itself. Most of the eastern rubberizers employ low gravity 68-72 gasoline because their sea level drying conditions do not readily permit complete evaporation of the heavier grades without expensive redrying or slow running machines, but rubberizers in certain inland sections are able to use even the V. M. P. grade and still obtain proper drying. This is an advantage of some value naturally. Complete drying of the coating and elimination of the residual solvent is desirable not only for reasons of odor and decomposition freedom, but because it tends to prevent softening of the rubber so that the starch is not absorbed too much to produce a satisfactory finish.

[1] THE INDIA RUBBER WORLD, SEPTEMBER 1, 1925, pp. 713-716.

Constructive Proofing Developments

It is interesting to note in connection with a reference made above that the proofers have progressed very slightly in the essentials of their work. An article published in 1907 refers to electric finishes having been used twenty-five years before. The electric effect was said to have been obtained by merely sprinkling the surface of a single texture proof with farina powder before being cold cured. Such references cannot help but make us feel that we have advanced only slightly in this line during the years which have shown so great a development in the entire rubber industry. It is felt, however, from certain signs that appear occasionally that we are starting now on real constructive development and that the next few years may produce types of rubberized products of marked superiority in design, treatment, and appearance over anything previously known.

Selenium and Vandex

THE results of Boggs and Follansbee on selenium in the vulcanization of rubber have assumed much practical interest and the use of selenium and its compounds is now being made generally available.

Selenium is one of 85 or more elements found in nature. It is seldom free, but occurs usually with other metals in ores, and is obtained in the refining processes. Its molecular weight is 79.2, or about 2½ times that of sulphur. Its chemical properties resemble those of sulphur and it belongs in the same group of the periodic system.

When selenium is mixed with rubber and heated under vulcanizing conditions a product results somewhat like that obtained with sulphur. Selenium and sulphur are allied in vulcanizing properties and may be used together very successfully. If the usual organic accelerators are also present, a very tough, rigid, high modulus cure results.

In addition to the increased rigidity and high modulus, greatly improved abrasion qualities are produced by selenium. This increased resistance to abrasion is greater than can be obtained by the use of increased accelerator and harder cure with sulphur alone.

It would seem as if the selenium produces an entirely new chemical combination with the rubber particle in addition to the sulphur combination. Compounds vulcanized to a correct cure with selenium and sulphur age very well, and especially when they contain Agerite.

Stocks containing selenium can be cured non-blooming but when 1.5 per cent on the rubber is used a greenish bloom appears similar, except in color, to sulphur bloom. Sulphur and selenium when used together always shorten the cure. Any of the commercial accelerators work well with selenium.

Several patents have been granted on the use of selenium and selenium compounds used in rubber.[1] The compound known as selenium diethyldithio-carbamate is very similar in action to Tuads or tetra-methyl-thiuram disulphide. When used in sufficient quantity it acts as a vulcanizing agent similar to sulphur.

Vandex

Of such selenium products for use in the vulcanization of rubber, one which is now being marketed is known as "Vandex." The chief advantages obtained by its use are the increase in abrasion resistance of high grade compounds and the possibility of using even larger quantities of reclaim without sacrificing wear resisting properties. The data below show quantitatively the effect of this selenium compound in influencing the abrasive wear index in zinc oxide and carbon black stocks accelerated with Tuads. When Vandex is added to increase the vulcanizing agents the amount of Tuads is decreased so as to maintain the same rate of cure for the two mixes under comparison.

	A	B
Rubber	100.00	100.00
Zinc oxide	120.00	120.00
Mineral rubber	4.00	4.00
Stearic acid	1.00	1.00
Agerite	1.00	1.00
Tuads	0.25	0.10
Sulphur	4.00	4.00
Vandex	.....	1.50
Cure 10 minutes at 270 degrees F.		
Tensile at break	3,660	2,860
% Elongation at break	650	620
Resistance to abrasion	100	125
Cure 25 minutes at 270 degrees F.		
Tensile at break	3,660	3,700
% Elongation at break	630	620
Resistance to abrasion	104	134
Cure 40 minutes at 270 degrees F.		
Tensile at break	3,400	3,500
% Elongation at break	620	610
Resistance to abrasion	113	144

Similar results are shown in a mix containing a large amount of carbon black accelerated with Captax.

	A	B	C
Rubber	100.0	100.0	100.0
Mineral rubber	5.0	5.0	5.0
Zinc oxide	5.0	5.0	5.0
Carbon black	40.0	40.0	40.0
Degras	2.0	2.0	2.0
Stearic acid	4.0	4.0	4.0
Agerite	1.0	1.0	1.0
Captax	0.6	0.6	0.6
Sulphur	3.0	3.0	3.0
Vandex	....	1.0	1.5
Cure 30 minutes at 287 degrees F.			
Tensile at break	4,500	4,800	5,020
% Elongation at break	640	625	570
Resistance to abrasion	100	169	194
Cure 45 minutes at 287 degrees F.			
Tensile at break	4,680	4,660	4,520
% Elongation at break	640	560	510
Resistance to abrasion	102	152	192

The foregoing abrasive resistance tests were made by a loose abrasive type of machine.

[1] C. R. Boggs, Simplex Wire & Cable Co., U. S. patents Nos. 1,249,272, and 1,364,055. P. I. Murrill, R. T. Vanderbilt Co., U. S. patents Nos. 1,622,534, 1,622,535, and 1,622,536.

Stearic Acid

The Advantages of This Compounding Material Have Brought It Strongly Into Current Practice

STEARIC acid and other fatty acids in combination with glycerine occur in animal fats and oils. It is commonly derived from beef fat by saponification or distillation. This process breaks up the glycerides or fat, liberating both oleic and stearic acids. Following this separation from the fats the material is put under hydraulic pressure which removes most of the liquid oleic acid without the aid of heat. The pressed stock remaining is next hot pressed to remove more of the low melting point material, leaving behind the purified stearic acid, which is molded into cakes or ground.

There are several commercial grades of stearic acid known as single, double and triple pressed. The single pressed grade is the one commonly used in rubber mixings for its beneficial effects on working qualities and tensile properties. It has a melting point of 126 degrees F. and is marketed in block or ground form. It has for some years been listed as a rubber softener and used more or less for that purpose.

The study of accelerators of vulcanization and the nature and function of the resins and proteins contained in crude rubber revealed to rubber technologists the great value possessed by stearic acids in rubber compounding aside from simple softening effect, important as that function is when required. The more generally used softener in the earlier days of the rubber industry was palm oil which served this purpose well when free from water, dirt, etc., especially in the shoe and mechanical divisions of the industry and when mixed rubbers of variable curing qualities were used.

Now that more is definitely known concerning the chemistry of rubbers, palm oil and other softeners are being superseded in favor of stearic acid because the latter is pure and of definite chemical effect. This is not the case with palm oil, for example, which varies greatly in consistency and free fatty acid content.

Stearic acid has apparently four effects in a rubber compound. These are, (1) as a dispersion agent and softener, (2) as a stabilizer of crude rubber grades to definite curing rate, (3) as an activator of accelerators, and (4) effective economically.

Stearic acid serves as a dispersing agent in a compound by reducing surface tension of the ingredients, thus permitting them to be more easily wet by the rubber and absorbed by it. In this way the stiffening effect of pigment aggregation is eliminated.

While the list of softeners used in rubber compounding is large, few of them are satisfactory for all around use as is stearic acid. Many which are satisfactory in an uncured compound, unfavorably affect the firmness and toughness of the vulcanized goods, while certain others are unfavorable to good aging. Stearic acid, however, not only softens uncured rubber mixings, giving smooth running stocks—even those containing large amounts of reclaim—but it introduces no objectionable features into the composition. The cured products are tough, snappy and age well.

High grades of crude rubber contain naturally a proportion of fatty acids. These are necessary for curing effect, and in cases where their presence and amount is more or less uncertain, the addition of stearic acid containing a percentage of oleic acid is desirable to stabilize the cure, especially in the presence of accelerators. Therefore, it is considered good practice to add one-half of a per cent of stearic acid in the rubber simply to stabilize the cure. This applies especially in the case of compounds cured with organic accelerators. Certain accelerators, however, require as high as one to two per cent stearic acid and in special instances two to four per cent is utilized.

Zinc oxide is the commonly used activator for organic accelerators, and for this purpose requires to be made soluble. The presence of a fatty acid, such as stearic, increases the amount of soluble zinc and so aids in the activation of the accelerator.

The ammonia type of accelerators such as hexamethylene-tetramine and diphenyl-guanidine; the amines, such as aniline and piperidine, all require soluble zinc as activator, therefore the presence of a zinc dissolving fatty acid like stearic is desirable.

In like manner the group represented by ethylidene aniline and the addition and condensation products of amines and aliphatic aldehydes are also benefited.

With mercapto type of accelerators stearic acid should be used in the proportion of one per cent to the rubber in lightly compounded stocks and three or more per cent in treads. The reason is that the speed of reaction of these accelerators as well as the physical properties developed depend on the presence of an adequate proportion of free fatty acid. Therefore, Captax, Monex, Thionex or similar acid accelerators require higher proportions of stearic acid than do the guanidines and the accelerators derived from or closely related to the ethylidine anilines.

The presence of stearic acid with the basic accelerators tends somewhat to neutralize them and retard their action slightly. With the acid accelerators that effect does not occur, and full effect is obtained both of the accelerator and the acid.

The effect of stearic acid in compounded stocks is illustrated by the following mixings containing a high proportion of carbon black accelerated with an acid accelerator. Tests made on the stocks of the same cure show remarkable improvement in the tensile properties.

TYPE MIXING, WITH AND WITHOUT STEARIC ACID

	A	B
Rubber	100.0	100.0
Zinc oxide	5.0	5.0
Carbon black	40.0	40.0
Captax	0.6	0.6
Sulphur	3.0	3.0
Stearic acid	0.0	4.0

TESTS OF MIXINGS, WITH AND WITHOUT STEARIC ACID

	Load at 300%		Tensile at Break		Elongation at Break	
Compound	A	B	A	B	A	B
Press Cure						
45 minutes at 40 lbs.	700	1,360	2,010	4,430	515	615

Similarly the effect is very marked by adding stearic acid to a tread type stock of the following composition:

Rubber	100.0
Micronex	42.5
Zinc oxide	5.0
Mineral rubber	5.0
Sulphur	3.5
D. O. T. G.	1.0

With the addition of one and two per cent, tensile strength remains unchanged, elongation is slightly but definitely improved, and the modulus at 300 per cent, or, in other words, the stiffness, is but slightly reduced. The use of three per cent introduces real softening effect, though leaving the tensile strength practically unaltered. The five per cent addition shows as excessive for tread and general mechanical compounding work, since at this point tensile properties fall off, and the vulcanized product is too soft.

The recommendation for a mixing of the above type where guanidine accelerators are used favors two per cent of stearic acid on the rubber. In case an acid accelerator is used such as Captax, Monex or Thionex this amount of stearic acid should be increased to four per cent.

The economy of using stearic acid consists in compound cost savings by utilizing cheap rubbers and in economy of time, power

and labor. The stearic acid addition stabilizes the rubber and facilitates mixing and cure of the compound. Its composition is definite, which is greatly in its favor.

The foregoing advantages of stearic acid have brought it strongly into current practice, and it is being used for the improvement of stocks of every type. With it very low percentages of zinc oxide are sufficient, thus reducing specific gravity by excluding unnecessary zinc and favorably influencing volume cost. The best tire treads now contain from two to four per cent of stearic acid on the rubber and the zinc oxide is limited to five per cent.

Native Theatricals on a Rubber Estate

Vincent Sauchelli

Malays have a great liking for the theatre and all other forms of amusement. From the very formal religious drama which dates to the court ballets of the old empire of Cambodia, Indo-China and of the Hindu culture of ancient Java, down to the *bangsawan* and *wayong-kulit* and just plain *ronggeng* of today, Malay relish for dance, drama, comedy, and plain buffoonery is well supplied, even though in a crude way. What our stage gives in elaborateness of scenery, gorgeous gowns and finished artistry is amply supplied by pure, childlike imagination.

The players shown in the group of Javanese amateur performers are only crude country mummers. But their audience will enjoy the legendary play enacted, regardless of the crude histrionics. Imagination will supply grandly any deficiency of scenery or costume. When the clown comes on the stage with a whip in his hand, everybody knows he is riding a spirited horse. A companion appears with a paddle. Need one tell the spectators he is paddling for life through a raging river? And the storming of a fort, kidnaping of the heroine and the subsequent fight with the villain are as simply indicated and as imaginatively appreciated by the spectators.

At the present time, in many parts of Malaya, periodical visits are made by native traveling troupes which present drama, opera

Javanese Amateur Players

or *bangsawan*, a popularized Malay version of our musical comedy. In this revue, the dresses are of the gaudiest, and the girls chosen usually from Javanese nationals are often comely enough to attract European attention. They are good, but when it comes to singing, Malay "chorines" are in a class by themselves. They have voices that were never meant to be musical. The comic stuff is excellent. The clowns do their stunts as well as any Ringling circus mirth producer, and always bring down the house. In Malaya you must know there are certain human types known to everybody, the Chinese rickshaw coolie who always "crabs" about his fee, the Sikh night-watchman, the Jaffa-Tamil office clerk, the European estate manager from up-country, and so on. Even the most amateur performer will select the funny characteristics of these types and exaggerate them just enough to make them ludicrous.

But lately, the movie has been ousting the *bangsawan* and the *wayong-kulit* or shadow picture show. American movies are very popular, particularly the western type with the shooting, fighting, killing and the hero-villain characters. To a native mind so skilled in translating facial and bodily gestures, it is only natural that the movie should make a strong appeal. Enterprising Chinese have chain theaters in all the leading centers of Malaya and the Dutch East Indies.

Tamils Ready for a Teevali Performance

The large Tamil population and the Chinese are well represented in the dramatic arts. Chinese troupes tour the Malay peninsula and the neighboring islands to provide elaborate entertainment for their own people. The Tamil performances are really religious festivals in celebration of some Hindu god. The performances of neither of these people show the spontaneity of the Malay entertainments. At the Hindu festivals of Taipusum and Teevali many an estate manager tries to escape the Tamil performers, who come to his bungalow compound in large numbers followed by the entire labor force. They sing his praises, dance and make an awful disturbance, since many of them are in a drunken condition from too much toddy. The manager is expected to distribute money to the crowd which is used for more toddy. After a white man sees this sort of thing once it ceases to be amusing.

Many plantations located far from populous centers encourage these amateur theatricals as a means to hold their labor forces. Life on estates is rather dull even for a Tamil. In Sumatra large plantation groups interested in the social side of their employes have erected theaters where moving pictures are enjoyed. Some also have a traveling movie which shows at different sections of the estate thus making it convenient for all to enjoy it.

So we see play has its value as much for the European as for the lowly coolie on a rubber estate. Surely "the play's the thing" wherewith to hold the native labor force contented.

AUSTRALIA'S TIRE PRODUCTION AND DEMAND

According to statistics prepared by *The Australian Motorist*, four Australian tire manufacturers produce a total of 16,000 casings weekly, or approximately 832,000 yearly. Although the names of these companies are not mentioned, it is believed that the four include Dunlop, Barnet Glass, Perdriau and Colonial.

The 1926 Australian tire demand is estimated as follows: 375,000 tires for original equipment for 75,000 cars which it is estimated were sold during the year; and about 1,150,000 replacement tires, bringing the total demand to about 1,500,000 tires. It is stated, however, that tire repairers are much more active than formerly, and that this total may be reduced by 250,000 tires through motorists having old tires repaired and retreaded.

What the Rubber Chemists Are Doing

Progress Report—Physical Testing Committee Rubber Division

ON October 12, 1926, R. P. Dinsmore, chairman of the Rubber Division of the American Chemical Society, appointed the following Physical Testing Committee: E. R. Bridgwater, E. I. duPont De Nemours & Co.; E. B. Curtis, The United States Rubber Co.; J. W. Schade, The B. F. Goodrich Co.; N. A. Shepard, The Firestone Tire & Rubber Co.; A. A. Somerville, R. T. Vanderbilt Co.; W. W. Vogt, The Goodyear Tire & Rubber Co.; P. L. Wormeley, Bureau of Standards; J. E. Partenheimer, The Fisk Rubber Co., chairman.

The committee was appointed to investigate the effect of variables such as temperature and relative humidity upon the physical properties of rubber. The committee felt that by having work of this type done at the Bureau of Standards by a Research Associate under the direction of the committee, the findings would have more weight in the industry than if investigations were carried out in several separated laboratories. The members of the committee agreed to share the expense of the investigation, with the Bureau of Standards contributing their facilities and the other members of the committee appropriating a total of $500 each. It should be clear to everyone that this method of standardizing testing methods and the investigation of the desirability of control of the several contributing variables would be much more economical and satisfactory. Everyone agreed that this idea was sound, and it was hoped that the results of this first work will warrant making this type of investigation a permanent thing, supported by a larger number of the interested concerns.

Purpose of the Research

The purpose of the committee is to determine the effect of possible variables in the physical testing of rubber so that we may know the relative importance of controlling these factors. It was felt that although considerable work has been done by Stringfield and others on the variations in physical properties of vulcanized rubber caused by variations in temperature and relative humidity during the various stages of preparing and testing the samples of rubber, nevertheless, there was still much to be done. The committee agreed that a study should be made of the effect of these two factors during milling, storing before curing and storing before testing with respect to the stress-strain, tensile and abrasive properties of the compound. It was decided that the stress-strain and tensile properties be studied first pending the development of a more satisfactory abrasion test.

F. E. Rupert, who has had two years' experience in the Research Division of The Fisk Rubber Co., was chosen as Research Associate to conduct the work at the Bureau of Standards. It was decided to limit the first investigation to the effect of exposure of the cured stock to variations in temperature and relative humidity for a predetermined period before and while obtaining the stress-strain curves. This was to show the relative importance of controlling these two factors and would allow us to eliminate variations in this part of the work while we were investigating the effect of these two variables upon the other operations of preparing the test specimens.

Keeping in view the real purpose of the committee, the importance of controlling temperature and relative humidity during storage and the testing of cured test specimens in a commercial laboratory, the following compounds were chosen for this work. They are necessarily arbitrary and open to much criticism and argument. However, we believe they are representative of type formulas in use today.

TEST FORMULAS

	1	2	3	4	5
Smoked sheets	100	100	100	100	100
Zinc oxide	5	5	5	5	5
Sulphur	3	3	3	3.5	3.5
Carbon black	...	...	...	40	40
D. O. T. G.	0.75	0.75	...	1.25	...
Mercapto-benzo-thiazole	...	...	0.5	...	1.0
Stearic acid	...	...	0.5	...	3.0
Mineral rubber	...	5	5	5	...
Pine tar	...	...	...	2	2

These formulas represent a laboratory test compound, two gum tire carcass stocks and two high grade tread compounds. With this range of compounds, we are able to study the effect of temperature and relative humidity upon gum and compounded types, the difference of the effects on two widely different types of accelerators and the difference in effect on compounds containing different amounts of some of the common softeners. The stocks were cured over a range of five cures each, going from an under to an over cure. The guanidine compounds were cured at 287 degrees F. or 141 degrees C., while the mercapto-benzo-thiazole stocks were cured at 258 degrees F. or 125 degrees C. The five cures of each of the five stocks were exposed at each of the six relative humidities—0, 20, 40, 60, 80, 100 per cent at each of five temperatures—5, 15, 25, 35, 45 degrees C. This required a 75-pound batch of each of the stocks which was mixed on a 60-inch mill and sheeted to gage and width on a factory calender. After a rest of 24 hours, the curing was carried out continuously in two pot presses and was completed in a period of 36 hours which eliminated all appreciable variation due to aging of the uncured stocks. This part of the work was carried out in a factory and the cured slabs were shipped to Washington. The rest of the investigation was carried out at the Bureau of Standards by exposing the cured slabs to the various relative humidities in conditioned boxes located in the testing room with controlled temperature.

Exposure and Tests

Forty-eight hours was chosen as the time to expose the slabs to the test temperature and relative humidity as covering usual commercial practice in regard to the time between curing and testing. However, a determination of the rate of absorption of moisture showed that all five stocks absorbed moisture at an appreciable rate for six days, after which very little was absorbed. We therefore ran sufficient additional tests with six days' exposure to determine the effect of this longer period. The stress-strain curves and tensiles were obtained on the latest autographic Scott testing machine loaned to the committee by the Henry L. Scott Co., and set up in the constant temperature room so that the specimens were actually broken at the same temperature at which they were conditioned.

Results

While the individual results show undesirable variations which cannot be explained, especially with respect to tensiles, nevertheless, a sufficient number of tests were run so that we are entirely justified in averaging the results which give us decided trends, allowing the following observations to be made. The effect of temperature is approximately three times as great as the effect of relative humidity. The specimens are very sensitive to change in temperature, making it absolutely necessary to test the piece at a uniform temperature. The temperature in the testing room should be controlled between comparatively narrow limits—differences of 10 degrees showing a marked effect.

Although the stress-strain and tensile properties of cured rubber are affected by variations in relative humidity, the effect is more gradual and the specimens are not so sensitive to relative humidity

changes. It will, therefore, be unnecessary to control the relative humidity in the testing room but will be sufficient to store the cured slabs in a conditioned chamber. While control of relative humidity within limits of 20 per cent would be satisfactory, 10 per cent would be necessary for accurate work.

Summary and Recommendation

Increasing relative humidity and increasing temperature individually or together reduce the modulus and tensile of all the stocks. While there is slightly more effect due to relative humidity after six days' exposure, the difference in results between two and six days is negligible. At the higher temperatures, the six-day exposures gave irregular results, no doubt due to the aging effect. The physical properties of the gum stocks are affected more than the carbon black stocks by changes in relative humidity. State of cure has very little influence upon the effect of differences in relative humidity. The guanidine and mercapto-benzo-thiazole stocks showed very little difference in degree of sensitivity to changes in relative humidity. The softeners exerted a negligible effect upon the results.

The committee therefore recommends that physical testing rooms be maintained at a constant temperature with a total variation of not more than 5 degrees, and that the cured specimens be stored in this room in a humidified chamber controlled to a relative humidity within limits of 10 per cent. A temperature of 25 degrees C. and relative humidity of 80 per cent is proposed.

As the next problem, the committee has chosen to study the effect of variations in temperature and relative humidity during the period between mixing and curing. From work which has already been published by Stringfield, we expect to find greater differences due to variations in relative humidity at this point of the preparation of the test specimens. The same five formulas as used in the first investigation will be used again.

This second investigation is already under way and the original appropriation of $3,500 will, we expect, complete this next problem, after which the committee feels the work should be financed by a more general representation of the industry if it is to be continued. We would like to have any suggestions as to the best means of doing this, and will welcome any ideas the members of the division have.

The Oxidation of Caoutchouc[1]

John McGregor Robertson and John A. Mair

In this paper the authors recount their investigation of the oxidation of caoutchouc with potassium permanganate, hydrogen peroxide and chromyl chloride and summarize their results in the following conclusions:

Oxidation with Potassium Permanganate

Caoutchouc, on oxidation with dilute aqueous potassium permanganate in neutral and in alkaline solution, gives a series of oxygenated products, regular in the first case, irregular in the second. These products are of the same general character as those obtained by other workers, differing, however, from the air-oxidation products in being insoluble in alcohol or acetone. They differ fundamentally from Spiller's resin in being insoluble in alkalis, whilst their insolubility in acetone and alcohol indicates that they are more closely related to the parent caoutchouc than the air-oxidation products described by Peachey. The complex structure associated with caoutchouc has been shown to persist throughout the series.

The suggestion has been made that the complex nature of the products is due to the presence in the caoutchouc molecule of a much larger aggregate of isoprene residues than is expressed in the usual formula.

The acidic products of the oxidations have been shown to consist of formic and acetic acids, together with oxalic and laevulinic acids. In addition complex resin acids, colloidal in character and of high molecular weight, have been isolated from both series of oxidations.

The chemical character of the oxidation products appears to be that of hydroxy-compounds, their inertness towards the usual reagents for the hydroxyl group being ascribed either to the complex nature of the aggregate or to the absence of primary alcoholic groupings. The ratio of carbon to hydrogen throughout the series shows that oxygen alone is directly added, there being no accompanying hydration. It must, therefore, be concluded that the permanganate oxidation of caoutchouc in dilute solution gives as final product a polyhydroxy-compound. Nothing definite can be said, owing to the impossibility of ensuring chemical purity, as to the chemical individuality of the products, but the characteristics of the latter as a whole are those of a definite oxidation series, rather than of a complex mixture of oxygenated substances.

Oxidation with Hydrogen Peroxide

Caoutchouc, on oxidation with hydrogen peroxide in glacial acetic acid-chloroform solution, gives as primary product a substance with alcoholic properties, with a composition corresponding to the empirical formula $C_{59}H_{102}O_{16}$. This substance must contain at least one primary alcohol grouping, since on oxidation with chromic acid it gives rise to an aldehyde.

The aldehyde in turn gives rise to a disemicarbazone, pointing to the presence of one ketonic and one aldehydic grouping, or, more probably, to two of the latter.

On oxidation in air the aldehyde is transformed to a resin acid, the aldehyde molecule apparently undergoing fission into two approximately equal parts.

During the oxidation of caoutchouc with hydrogen peroxide carbon dioxide is evolved, the proportion of carbon set free in this form corresponding to the liberation of one atom from a complex of 40 or 45 carbon atoms.

Oxidation with Chromyl Chloride

The oxidation of caoutchouc with chromyl chloride gives rise to two main products, a resin with aldehydic properties, oxidizable to a resin acid, and a complex, insoluble product containing both chromium and chlorine.

The insoluble residue undergoes decomposition on heating with glacial acetic acid, chromium and chlorine being eliminated, and a resin of aldehydic properties being formed. This resin aldehyde is also oxidizable to a closely related resin acid.

The insoluble product is decomposed on prolonged heating with aqueous sodium carbonate, a resin acid being formed with the elimination of chromium and chlorine.

The insoluble product does not appear when the caoutchouc-chromyl chloride compound is decomposed by sulphurous acid. This has been explained by assuming that the insoluble product arises through polymerization of the chromyl chloride compound during decomposition.

The probable presence of laevulinic aldehyde as a decomposition product has been shown.

The complexity of the oxidation products indicates that the caoutchouc molecule is of very high molecular weight and complexity, the simplest oxidation product containing at least 40 carbon atoms. Owing to the impracticability of molecular weight determinations, no upper limit for the products can be fixed.

[1] *J. Soc. of Chem. Ind.* February 11, 1927, pp. 41T-49T.

CHEMICAL INDUSTRIES EXPOSITION

The eleventh Exposition of Chemical Industries will be held from September 26 to October 1 at the Grand Central Palace, New York, N. Y. Both domestic and foreign exhibitors will participate, and it is believed that this year's sessions will be particularly interesting in their discussion of important problems and explanations of recent developments in connection with the various industries.

Chemical Patents

United States

1,624,088. COMPOSITION OF CHICLE. An aqueous dispersion of gum chicle and a hydrophilic colloid.—Arthur Biddle, Trenton, New Jersey, assignor to United Products Corp. of America.

1,624,089. INSECT LIME. An insect lime comprising rubber dispersed in an aqueous medium and a non-drying oil.—Arthur Biddle, Trenton, New Jersey, assignor to United Products Corp. of America.

1,624,723. ACCELERATOR. The product obtainable by condensing a nitroso-dialklyl-amino compound with a primary amine and condensing the resulting amino hydrozine derivative with a reactive aldehyde.—Harold W. Elley and Donald H. Powers, assignors to E. I. du Pont de Nemours & Co., all of Wilmington, Delaware.

1,624,724. RUBBER ANTI-OXIDANT. The method of protecting a rubber composition from oxidation by incorporating into it an aryl compound containing nitro, amino and hydroxy groups.—Harold W. Elley, assignor to E. I. du Pont de Nemours & Co., both of Wilmington, Delaware.

1,626,493. ADHESIVE. A surgical dressing adhesive consisting of a sterilized rubber latex emulsion containing a stabilizing agent.—William F. Zimmerli, Akron, Ohio, and Carlisle H. Bibb, New Brunswick, New Jersey, assignors to Johnson & Johnson, New Brunswick, New Jersey.

1,626,784. RUBBER DETERIORATION RETARDER AND PROCESS OF MAKING IT. A deterioration retarder for rubber is made by combining acetaldehyde and an aromatic amine in a hydrochloric acid solution.—Sidney M. Cadwell, Leonia, New Jersey, assignor to The Naugatuck Chemical Co.

1,626,800. RUBBER RECLAIMING PROCESS. This comprises reduction of the stock to a fine state of division and subjecting it to treatment with tetra-hydronaphthalene.—Marcus J. Fessler, Syracuse, New York.

1,627,278. COLLOIDAL ADHESSIVE. A composition comprising colloidal clay in suspension and rubber in emulsion in water. The clay predominating substantially in quantity over the rubber.—Bradley Dewey, assignor to Dewey & Almy Chemical Co., both of Cambridge, Massachusetts.

Dominion of Canada

269,950. LINING FOR CAN ENDS. A compound for lining can ends, etc., comprising a body material, latex, and a double metal alkali alginate.—The American Can Co., New York, N. Y., assignee of John E. Robinson, Oak Park, Illinois.

269,877. LIQUIDIZED RUBBER. The method consists in soaking finely cut crude rubber in benzole, then adding carbon tetrachloride to the mixture and cooking it 2 to 3 hours at 100 degrees C. A mixture of cooked rosin, linseed oil. Kauri, damar and copal is added to the cooked rubber and the final product stirred to proper consistency.—Harold P. Butler, New York, N. Y.

270,003. RUBBER COMPOUND. An improved composite gum product adapted to resist ozone, comprising an elastic gum-containing body portion and a gum-containing covering. The covering being unvulcanized and therefore substantially free from internal stresses.—The Simplex Wire & Cable Co., Boston, assignee of Charles R. Boggs, Waban, and John T. Blake, Boston, all in Massachusetts.

270,132. TIRE SEALING COMPOUND. Ground asbestos, and slippery elm bark mixed together with an aromatic essential oil, a dye to color and water in suitable proportions.—Albert M. Wallace, Wilke. Saskatchewan, Canada.

270,158. RUBBER AND PAPER COMBINATION. A method of reinforcing the material retention of a paper making pulp by mixing dispersed reinforcing material with the beaten pulp in the presence of dispersed rubber.—The Dominion Rubber Co., Ltd., Montreal, assignee of Reed P. Rose, Jackson Heights, Long Island, New York, U. S. A.

270,206. RUBBER SHEET. A relatively thick film of soft rubber adapted for use as sheet material is backed with flexible paper surfaced with a smooth, even, uniform coating of lac and rosin.—The Westfield River Paper Co., Russell, assignee of Gerhardt E. Grimm, Springfield, both in Massachusetts.

270,352. VULCANIZING METHOD. Accelerating vulcanization by the presence of a nitroso-carbazole derivative.—The Goodyear Tire & Rubber Co., Akron, Ohio, assignee of Dexter N. Shaw, Philadelphia, Pennsylvania.

United Kingdom

265,651. TRANSFERS. The material to form the supporting film in a chromo-lithographic transfer for decorating wood, metal, glass and other materials, preferably consists of a mixture of 900 parts by weight of copal varnish, 75 parts of linseed oil, and 25 parts of rubber. The ink for printing the design is preferably prepared by adding to ordinary lithographic ink about 15 per cent by weight of the same mixture.—H. Courmont, 52 Rue de la Tour d'Auvergne, Paris, France.

265,677. RUBBER SUBSTITUTE. Plastic and resinous materials usable for electric insulation, artificial rubber, etc., are obtained by treating animal or vegetable fatty substances or a mixture of fatty acids and glycerine with steam under pressure in the presence of calcium carbide, so that the acetylene generated will combine with the fatty material.—L. Bourgoin, 975 Sherbrooke street East, Montreal Canada.

265,919.† ACCELERATOR. An accelerator of vulcanization consists of a halogen derivative of a mercapto-thiazole, mercapto-aryl-thiazole or mercapto-benzo-thiazole, or salts of these.—Goodyear Tire & Rubber Co., Akron, assignees of J. Teppema, Tallmadge, both in Ohio, U. S. A.

265,920.† ACCELERATOR. This consists of a mercapto-aryl-thiazole or a metallic salt of it whose substituted aryl structure includes an element having an atomic weight of more than thirteen.—Goodyear Tire & Rubber Co., Akron, assignee of L. B. Sebrell, Cuyahoga Falls, both in Ohio, U. S. A.

265,929.† VULCANIZATION OF CUSHION TIRES. Cushion tires are cured to steel rims in molds, the internal cushion cavity being formed by the inclusion of a canvas bag filled with sand. After vulcanization the sand is removed by an air or liquid blast through holes in the rim which are afterwards filled with metal plugs.—Pirelli & Co., 21 Via Fabia Filzi, Milan, Italy.

265,930.† ACCELERATOR. This consists of a primary amine and 2 or more molecules of an alpha, beta saturated aldehyde, the condensation being affected in the presence of an acid condensing agent.—Grasselli Chemical Co., 1300 Guardian building, Cleveland, Ohio, assignees of W. B. Burnett and Ira Williams, Mellon Institute, Pittsburgh, Pennsylvania, both in U. S. A.

265,931.† ACCELERATOR. Aldehyde-amine condensation products. An example of the use of this type of product as vulcanization accelerators is as follows: rubber, 100 parts, mixed with sulphur, 3 parts; zinc oxide, 5 parts; gas black, 25 parts; and the accelerator, 1 part, is vulcanized at 140 degrees C. for 30 minutes.—Grasselli Chemical Co., 1300 Guardian building, Cleveland, Ohio, assignees of W. B. Burnett and Ira Williams, Mellon Institute, Pittsburgh, Pennsylvania, both in U. S. A.

266,125. FIBROUS SHEET ROOFING. Hydraulic cements for making sheet roofing, etc., are prevented from setting during storage by the addition of organic colloids, namely rubber, gutta percha, balata, gutta percha resins, etc., which are destroyed on exposure and thus allow setting to take place.—A. E. Hills, The Red Cottage, Lingfield, Surrey.

266,145. SOLVENT RECOVERY. Volatile solvents are recovered in the working up of rubber, etc., by circulating over the substances a gaseous medium consisting of oxygen and nitrogen containing a less proportion of oxygen than air. A gas such as carbon dioxide having a higher specific heat than air may be added. The gas is repeatedly circulated until saturated with solvent vapors or until the proportion of such vapors is above the upper explosion limit.—A. L. Mond, 19 Southampton buildings, London. (Metallbank und Metallurgische Ges. A. G., 45 Bockenheimer Anlage, Frankfort-on-Main, Germany.)

266,168. PULP AND FIBROUS MATERIAL. Where rubber latex is added to strong pulp made from various kinds of cellulosic and ligneous materials a light, rigid, tough molded article may be obtained which may be polished.—R. A. Marr, 624 Boisevain avenue and Ramar Syndicate, 200 Granby street, both in Norfolk, Virginia, U. S. A.

266,374. PUNCTURE SEALING COMPOUND. This consists of the following ingredients; 50 parts by weight of water, 8 parts of dextrine, 35 parts of plumbago, and 1½ parts of plaster.—A. Cordonier, 90 Rue Lebroussart, assignee of T. van Boeckhout, 16 Rue de la Perle, both in Brussels, Belgium.

266,418. VULCANIZING. The direct vulcanization of uncoagulated rubber latex under such conditions as to preclude any substantial coagulation, is applied to concentrated latex, preferably a paste containing at least 53 per cent of caoutchouc. Conditions inhibitive of coagulation, are a non-acid mixing or the addition of basic reagents or protective colloids such as soaps, alkali lysalbuminate, or casein.—P. Schidrowitz, 57 Chancery Lane, London, and Vultex, Ltd., 24 Beresford street, St. Helier, Jersey.

266,516. OFFSET PRINTING BLANKETS. An offset printing blanket is provided with a surface layer of rubber or other colloid, or a mixture thereof hardened by light action so as to be unaffected by the constituents of printing ink.—A. R. Trist, 56 Victoria street, Westminster.

266,732.† VULCANIZING RUBBER. Vulcanization is accelerated by the addition of salts of potassium or rubidium, particularly organic acid salts. The most efficient are the salts of monobasic fatty acids, those of acetic, butyric, valoric, palmitic, and stearic acids being specified.—Society Italiana Pirelli, 21 via Fabio Filzi, Milan, Italy.

266,813. COMPOUNDED SHEET. Double texture water proof fabrics are united together by a spread coating of rubber solution containing 5 per cent of barium sulphate, and 10 per cent of zinc oxide. The doubled fabrics are pressed and heated to 140 to 160 degrees C. to smooth them.—C. Hafele, Lustnau, Tubingen, Wurtemberg, Germany.

† Not accepted.

ELECTRICAL PROPERTIES OF COMPOUNDS

The following is from the Technical News Bulletin (No. 119) of the Bureau of Standards.

The results of an investigation of the electrical properties and the density of compounds of rubber and sulphur are being prepared for publication. These results are of interest, not only in so far as they relate to practical soft rubber and hard rubber insulation, but also in that they shed light on the nature of the reaction of rubber with sulphur.

When the electrical properties and the density of vulcanized rubber are plotted against the percentage of combined sulphur, curves are obtained which show points of inflection at definite compositions. The table below indicates the manner in which the slopes of these curves change at the points of inflection.

Composition, Sulphur	Empirical Formula	Molecular Volume	Dielectric Constant	Power Factor	Resistivity
10.5	$(C_5H_8)_4S$	.....	Maximum	.....	Small change
13.5	$(C_5H_8)_8S^1$	.....	.....	Maximum	Do.
19	$(C_5H_8)_2S$	Large change	Minimum	Minimum	Do.
26	$(C_5H_8)_4S_2$	.....	.....	.....	Maximum

[1]Equivalent to $(C_5H_8)_4S$. $(C_5H_8)_2S$.

BRITISH GUIANA'S EXPORTS OF LOCAL PRODUCE DURING THE calendar year 1926 include the following: rubber, 34,360 pounds, as compared with 10,752 pounds for the year previous; and balata, 597,401 pounds in 1926 as against 904,784 pounds in 1925.

American Rubber Technologists

THE INDIA RUBBER WORLD'S brief biographies of American rubber technologists are approved by leaders of the rubber industry because the ambition, imagination and practical accomplishments of these men are largely responsible for America's leadership in the world's rubber manufacturing industry. Technical superintendents, chemists, process and development engineers in rubber manufacturing and reclaiming plants, research, testing and service laboratories are invited to send their biographical data to us for publication.

RAYMOND B. STRINGFIELD, chem., *b.* Dec. 15, 1891, Pomona, Calif.; A. B. in chem., Univ. of So. Calif., 1913; S. B. in chem. eng., M. I. T., 1915; chem., Smith-Emery & Co., San Francisco, 1915-16; chf. chem., Butte & Superior Mining Co., Butte, Mont., 1917; supt. chem. dept., Pacific Minerals & Chem. Co., Los Angeles, 1918; chem engr., Arthur R. Maas labs., Los Angeles, 1919-20; chem. engr., compounder and mgr. service labs., Goodyear T. & R. Co., Los Angeles and Akron, Ohio, 1920-26; chf. chem., Goodyear T. & R. Co. of Calif., Los Angeles, since July 1, 1926. *Author:* Technical papers and patents on potassium permanganate mfgr., potash leaching, rubber technology, effect of humidity on rubber testing. *Member:* Amer. Chem. Soc., Inst. Rubber Ind., Sigma Alpha Epsilon, Phi Lambda Upsilon, Masons, Fox Hills Country Club, Los Angeles. *Address:* 2238 Victoria avenue, Los Angeles, Calif.

Simon Collier, chem., *b.* June 1, 1895, Salem, Mass.; B. S. Worcester Poly. Inst., 1916; chem. Boston Belting Co., 1916-1920; asso. chem., in charge physical and chemical testing rubber goods, Bu. Standards, 1920-1923; chf. chem., Waukegan factories, Waukegan, Ill., Johns-Manville Corp., 1923. *Member:* A. C. S.; A. S. T. M.; chairman, Committee on Standard Methods Analysis Rubber Goods, Rubber Division, A. C. S.; chairman, Sub-Committee X 1, D 11, A. S. T. M. Chemical Analysis Rubber Products. *Coauthor:* Bu. Standards Papers on Sulphur and Antimony in Rubber Goods; Bu. Standards, Circular 38, Testing Rubber Goods; Fed. Specif. Mechanical Rubber Goods, Druggists' Sundries and Tires. *Address:* 412 Hull Court, Waukegan, Ill.

Webster Newton Jones, chem., *b.* Rich Hill, Mo., July 29, 1887; A. B. 1908, A. M. 1909, U. of Mo.; Ph. D. 1920, Harvard U. Austin teaching fellowship, Harvard; instructor in chem., Purdue U., U. of Me., U. of Mo.; asst. prof. chem., U. of Mont.; chem. expert War Trade Board; 1919-1925 research chem., B. F. Goodrich Co.; 1925 mgr. gen. chem. labs., B. F. Goodrich Co.; 1926 mgr. raw materials div. and gen. chem. labs., B. F. Goodrich Co., Akron, O. *Author:* Tribromnitroiodbenzene; Studies in Cyclopropane Series; Prices of Coal Tar Crudes, Intermediates and Dyes; A Low Temperature Combustion Method for Oxidation of Rubber. *Coauthor* of Trimethyl Pentane. *Member:* AXE chemical fraternity; ATQ social fraternity; Amer. Chem Soc.; Amer. Inst. of Chem. Engrs. *Address:* 751 Hillsdale avenue, Akron, Ohio.

Courtland L. Hungerford, indus. engr., *b.* Jan. 18, 1898, Costello, Pa.; B. S. U. of Akron, 1923; time study, Firestone T. & R. Co., Akron, O., 1922-1926; director, safety and hygiene, Firestone T. & R. Co., since 1926. *Author:* Employment Methods in Industries of Akron. *Member:* Chairman Bulletin Committee, Rubber Section, National Safety Council. *Address:* 398 Eleventh street, Cuyahoga Falls, O.

Ben Wright Rowland, chem., *b.* 1893, Boulder, Colo.; State Prep School of Col.; A. B. U. of Col., 1917; Ph. D. phys. chem., U. of Wis., 1925; instructor, U. of Wis., 1917-1918; gas. chem., U. S. Bu. of Mines, 1918-1919; instructor, U. of N. Dakota, 1919-1921; instructor, U. of Wis., 1921-1925; research chem., Goodyear T. & R. Co., since 1925. *Author:* Papers on physical chemistry of colloidal proteins, research on war gas, colloidal silver halides, thermo-chemistry of rubber. *Member:* Amer. Chem. Soc. *Address:* 77 Cotter avenue, Akron, O.

Charles Berlow, chem., *b.* July 17, 1897, Boston, Mass.; North Eastern U., 1919; chf. chem. lab. of Dr. Lothar Weber, Boston, Mass., 1919-1924; chem. Fisk Rubber Co., Chicopee Falls, Mass., 1924-1925; since 1925 chf. chem. Amer. Wringer Co., Woonsocket, R. I. *Address:* 46 Roberts street, Woonsocket, R. I.

Joseph E. Partenheimer, engr., *b.* Mar. 30, 1896, Greenfield, Mass.; Greenfield High School; B. A. Amherst Coll., Amherst, Mass.; Butterworth-Judson Corp., Newark, N. J.; 1918-1919; mgr. compound div., Fisk Rubber Co., since 1919. *Member:* Amer. Chem. Soc., Masons, University Club, Springfield, Mass. *Address:* Fisk Rubber Co., Chicopee Falls, Mass.

William Smock Wolfe, engr., *b.* 1890, Paulding, N. Y.; A. B. Marietta Coll., Marietta, O., 1910; B. S., M. I. T., 1912; development dept. Goodyear T. & R. Co., 1912-1914; foreman bicycle tire dept., 1915-1917; in charge of pneumatic tire development work, 1917-1918; Motor Transportation Corps, Washington, D. C., 1918; in charge Goodyear tech. service, 1920-1921; Goodyear development mgr.; since 1922, vice president and factory mgr. Seiberling Rubber Co., Akron, O. *Member:* Delta Upsilon, Phi Beta Kappa, member Tire Executive Comm. Rubber Asso. of Amer. *Address:* Fairlawn, O.

William Alexander Douglass, chem. *b.* Aug. 6, 1892, Ionia, Mich.; A. B. Cornell U., 1915; graduate work, 1915-1917; research chem. eastern lab. E. I. duPont de Nemours Co., 1917-1919; since 1919, Jackson labs., duPont Co., Wilmington, Del. *Member:* Amer. Chem. Soc., Franklin Inst., Kappa Sigma, Alpha Chi Sigma. *Address:* P. O. Box 525, Wilmington, Del.

William Stansfield Calcott, chem. engr., *b.* Dec. 13, 1892, Norfolk, Va.; chem. engr., U. of Va., 1913; General Electric Co., 1913-1915; E. I. duPont de Nemours, 1915, mgr. org. div. Jackson lab. *Author:* Professional and research work papers. laboratory corrosion; joint author A. I. C. E. monograph and other papers on corrosion, papers on organic dye analyses, etc.; patents, recovery of chloractic waste liquors, manufacture of tetraethyl lead, etc. *Member:* A. I. C. E., A. C. S., A. S. T. M., A. I. C., A. O. A., Alpha Chi Sigma, Tau Beta Pi. *Address:* 8 Riverside Apts., Penngrove, N. J.

Donald Howard Powers, chem., *b.* Mar. 31, 1901, Boston, Mass.; Boston Latin School; A. B. Boston U., 1921; Princeton U., A. B. 1923, Ph. D. 1924; fellow in chemistry, Princeton, 1924; research chem. E. I. duPont de Nemours & Co., 1924. *Author jointly:* A Study of Hydroxy and Alkoxy Hydroxamic Acids; The Guanidines as Accelerators. *Author:* The Contribution of the Dyestuff Industry in the Development of the Rubber Industry. *Member:* Amer. Chem. Soc., Sigma Alpha Epsilon. *Address:* P. O. Box 525, Wilmington, Del.

Harold W. Ellery, chem., *b.* May 16, 1891, Madison, Nebr.; U. of Neb., B. Sc., 1912, A. M., 1913; Cornell U., Ph. D., 1916; research chem., E. I. duPont de Nemours & Co., Wilmington, Del., since 1916; asso. director, Jackson labs.; research on dye intermediates and miscellaneous organic chemicals, patents on accelerators of vulcanization and flotation agents. *Author:* The Guanidines as Accelerators. *Member:* Amer. Chem. Soc., Sigma Xi, Alpha Chi Sigma, Gamma Alpha. *Address:* P. O. Box 525, Wilmington, Del.

I. W. Robertson, chem. engr., *b.* 1885, Paducah, Ky.; B. S. U. of Ky., 1910; post grad. study at U. of Pittsburgh and Carnegie Inst. of Tech.; asst. chem. P. R. R. Co. labs., Altoona, Pa.; chem., Atlanta Steel Co., Atlanta, Ga.; research on explosives, oils and gases, Bu. of Mines, Pittsburgh, Pa.; since 1915 chf. chem. engr., Miller Rubber Co., Akron, O. *Member:* Masons and Odd Fellows. *Address:* 24 West Salome avenue, Akron, O.

Kenneth C. Underwood, engr., *b.* Oct. 11, 1890, Newark, N. J.; M. E. Stevens Inst. Tech., Hoboken, N. J., 1915; Edison Lamp Works, 1915-1916; E. I. duPont de Nemours & Co., Arlington, N. J., 1916-1920; Manhattan Rubber Mfg. Co., since 1920; gen-research and development work in electric lamps, pyralin and rubber belting; patents on recovery devices and time recording devices. *Address:* 221 Berkeley avenue, Bloomfield, N. J.

Joseph Breckley, chem., *b.* Aug. 19, 1896, Ocean City, N. J.; B. S., Rutgers U., New Brunswick, N. J., 1919; development dept., B. F. Goodrich Co., Akron, O., 1919-1920; research dept., Barrett Co., New York, N. Y., 1920-1921; chf. chem. Lambertville Rubber Co., Lambertville, N. J.; chf. chem. Seamless Rubber Co., New Haven, Conn; since 1924, secretary and technical director, Dovan Chemical Co., New York, N. Y. *Member:* Kappa Sigma. *Address:* 189 Liberty street, Bloomfield, N. J.

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. The publications which give details of the rubber industry in some one country are marked with an asterisk.

Number	Special Circular
1473	"Tire Exporters' Weekly News Letter."
*1477	"March Imports of Golf Balls Into the United States."
*1478	"March Imports of Rubber Tires Into the United States."
1480	"Tire Exporters' Weekly News Letter."
*1485	"Crude Rubber Reexports From the United States; Month of March, 1927."
*1488	"Spanish Market for Automotive Rubber Goods."
1489	"Dealers' Stocks of Automobile Tires as of April 1, 1927."
1490	"Tire Exporters' Weekly News Letter."
*1492	"Canadian Tire Exports During March, 1927."
*1493	"Canadian Tire Exports Heavy During First Quarter of 1927."
*1494	"Canadian Rubber Footwear Exports During First Quarter of 1927."
1496	"Crude Rubber News Letter."
1497	"Mechanical Rubber Goods Exporters' Monthly News Letter."
*1498	"Dollar Return on Canadian Exports Continues to Decline."
*1499	"British Exports of Automobile Casings During March and First Quarter of 1927."
*1500	"British Exports of Rubber Footwear During March and First Quarter of 1927."
*1501	"United States Reclaimed Rubber Production and Consumption—1926."
*1502	"Preliminary Statistics of United States Crude Rubber Imports—April, 1927."
1504	"Crude Rubber News Letter."

TIRE INVENTORY — PRODUCTION — DOMESTIC SHIPMENTS

During March there was an advance in both production and shipments of all classes of pneumatic casings as well as inner tubes, as compared with the month previous, this applying also to the figures for solid and cushion tires. There has been, however, a corresponding gain in inventory, although the March inventory for solid and cushion tires shows a slight lessening. Shipments during the first quarter of this year of all types of pneumatic casings have been as follows: January, 3,699,122; February, 3,344,071; and March, 4,276,107. Shipments for these three months of all types of inner tubes have totaled: January, 4,512,273; February, 3,840,194; and March, 4,618,365.

Since the year 1921 the production of all types of pneumatic casings has advanced from a total of 21,819,779 to 46,104,201 for 1926, while the corresponding figures for inner tubes are 27,102,206 and 57,463,807. Production of solid tires has, however, changed little from the 1921 figure of 424,252, the 1926 total being 479,617. Production of balloon casings only has been as follows: 1924, 4,428,074; 1925, 15,567,644; and 1926, 21,824,489.

The amount of cotton fabric consumed by the tire industry during the first three months of this year indicates a probable increase for 1927 over previous years, the figures being: January, 14,358,414 pounds; February, 13,609,241; and March, 16,650,598 pounds. There is a similar advance in the amount of crude rubber used during this period, acording to the following totals: January, 44,078,473 pounds; February, 45,036,863; and March, 50,614,399 pounds.

	March, 1927		
	Inventory*	Production	Total Shipments
Pneumatic casings—all types	8,687,312	4,707,672	4,276,107
Inner tubes—all types	12,822,004	5,388,312	4,618,365
Balloon casings	3,500,757	2,709,647	2,440,651
Balloon inner tubes	4,706,834	3,081,618	2,546,176
High pressure cord casings	4,534,254	1,920,170	1,746,474
High pressure inner tubes	8,115,170	2,306,694	2,072,189
Solid and cushion tires	157,007	54,691	59,706

COTTON AND CRUDE RUBBER CONSUMPTION IN TIRES AND TUBES

	Pounds
Cotton fabric	16,650,598
Crude rubber	50,614,399

*As of March 31, 1927.
Rubber Association figures representing 75 per cent of the industry.

During the year 1926 American manufacturers exported 1,497,132 automobile casings, value $24,358,907. Inner tubes numbered 1,127,175, value $3,024,177, and solid tires for automobiles and motor trucks, 98,122, value $3,457,505.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished those who read them. The Editor is therefore glad to have those interested communicate with him.

Number	Inquiry
945	Machinery for reclaiming scrap rubber.
946	Makers of the "Durco" inflated toys.
947	Manufacturers of slate flour.
948	American manufacturer of automobile and bicycle tires desirous of placing agency in Austria-Hungary and Yugoslavia.
949	Appliances for superheating steam before it enters vulcanizer.
950	Manufacturers of erasive rubbers.
951	Source of supply for solid tires for rickshaws and carriages.
952	Information regarding manufacture of friction and common rubber belts.
953	Manufacturer of rubber toys.
954	Source of supply for rubber latex in small quantities.
955	Names and addresses of leading hose manufacturers.
956	Crude rubber cutting machines.

Foreign Trade Information

For further information concerning the inquiries listed below, address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Country and Commodity	Purchase or Agency
25,000	Portugal. Rubber goods	Agency
25,055	Denmark. Boots and galoshes	Agency
25,056	Czechoslovakia. Rubber goods, especially druggists' rubber sundries, and sport articles	Agency
25,057	Switzerland. Automobile and truck tires, rubber mats, horn bulbs, gloves, and toy balloons	Agency
25,058	Czechoslovakia. Automobile and motor cycle tires	Agency
25,086	Germany. Boots and shoes, especially tennis shoes, druggists' rubber sundries, sponges, stockings, air cushions, and aprons	Agency
25,106	England. Rubber water bottles	Purchase or Agency
25,125	Germany. Rubber belting	Agency
25,133	Germany. Mineral rubber	Purchase and Agency
25,220	Germany. Rubber-slitting machines for cutting fine rubber threads	Purchase
25,244	Spain. Rubber garden hose	Purchase and Agency
25,259	Denmark. Rubber goods	Agency
25,329	South Africa. Rubber washers, ½-inch	Purchase
25,330	Palestine. Heels for men's and women's shoes	Purchase
25,331	Colombia. Rubber floor covering	Agency
25,332	Barbados. Rubber goods of all kinds, including automobile and truck tires	Agency
25,333	Italy. Boots, overshoes, tennis shoes, and rubber articles in general	Agency
25,409	Czechoslovakia. Rubber sport goods	Agency
25,428	Netherlands. Automobile tires, pneumatic and solid, and inner tubes	Agency
25,429	Germany. Druggists' rubber sundries, and novelties	Purchase and Agency
25,449	Italy. Imitation leather, and waterproof coverings for automobiles	Purchase and Agency
25,461	Egypt. Rubber goods	Agency
25,469	Germany. Crude, scrap, and reclaimed rubber	Purchase
25,471	Australia. Hard rubber jars, for batteries	Purchase
25,478	Spain. Rubber goods	Agency

GUAYULE RUBBER EXPORTS

Exports from Torreon, Mexico, of guayule rubber are estimated as follows by the Department of Commerce: 1925, 2,737,468 pounds, value $602,862; 1926, 4,299,157 pounds, value $1,279,122. Shipments of guayule during the first quarter of 1926 totaled 1,368,775 pounds, value $521,265; the 1927 figures being 1,423,600 pounds, value $347,046.

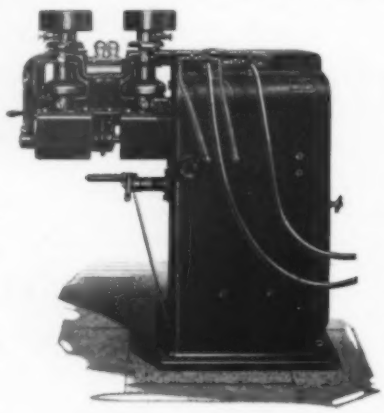
GOLF BALL IMPORTS

United States imports of golf balls during the first quarter of the present year show a seasonal increase, the January total being 47,898 balls, value $12,050; February, 183,494, value $71,720; and March, 246,221, value $85,538. The January and March imports were entirely from the United Kingdom.

New Machines and Appliances

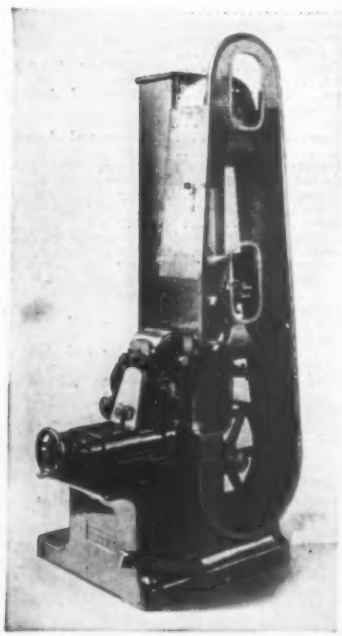
New Debeading Machine

THE element of cost in preparing waste pneumatic tires for reclaiming is highly important. One of the most difficult features of this work is the removal of the tire beads with high speed and the least waste of good stock. This problem has been effectually solved by the entirely new machine here represented. It is operated by electricity and controlled by compressed air. The feed is positive and the design of the knife mechanism enables a single operator to cut the beads from more than 100 tires an hour. The capacity of the machine is such that all passenger car tires can be debeaded from 18-inch rim size up.—The Williams Foundry & Machine Co., Akron, Ohio.



Akron-Williams Debeader

Polishing Machine



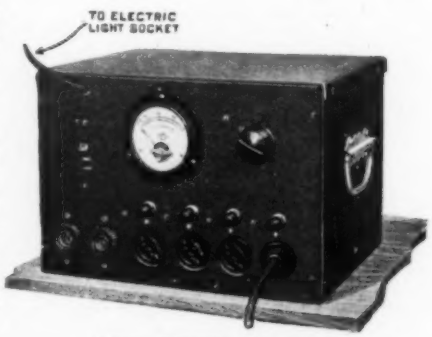
Centerless Grinder

The illustration pictures a polishing machine of new design. It is specially adapted for finishing cylindrical work such as fountain pens, wringer rolls and similar work, although flat and other shapes may be polished on this machine the same as on any other belt grinder.

The feature of greatest interest in this machine is the patented centerless feed. This consists of an endless belt, driven from below, the drive being taken from the main shaft. Provision has been made for tilting the feed unit for more or less feed. The adjustment for various diameters is controlled by a conveniently located hand wheel. The work rest connected with the adjusting mechanism is operated by this hand wheel so that the rest always assumes the same relative position whether the work is ¼ or 6 inches in diameter. This is a feature of great importance and tends to make the setting-up fool proof. The polishing belt is brought into action on the work by means of a foot lever which operates the pressure platen back of the belt. This platen is independently adjustable, and provision is made for changing the platens when necessary for various kinds of work.—Production Machine Co., Greenfield, Massachusetts.

Electric Tire Repair Unit

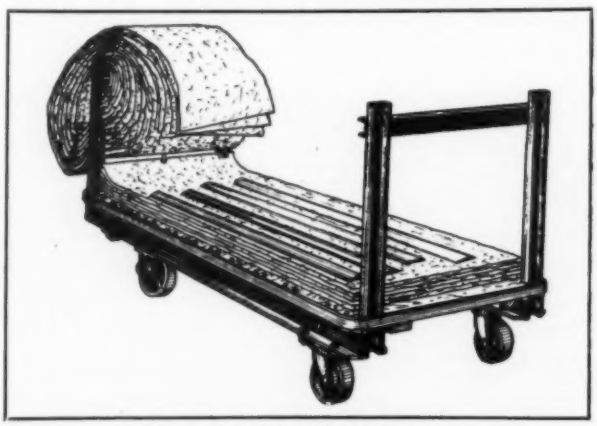
The repair to a modern tire is built on the inside of the casing and properly should be cured by heat applied directly to the repair, instead of first passing through the body of the tire. The well-known "Tyrwelder" apparatus cures the repair by the use of a steam heated core with heavy pressure applied all around the tire from bead to bead. In the case of breaks that go entirely through the carcass, curing must also be effected at the same time from the outside. Both inside and outside repairs on most tires can be cured at the same time by the electric spot welder, the electric control for which is here pictured. This instrument is connected to an electric light socket and the current is conducted to a flexible asbestos and rubber heating pad. The latter is placed between a pressure cushion and the tire. The control unit is contained in a compact metal box, 8 by 8 by 12 inches, and all controls are conveniently mounted on the front panel. This arrangement is unexcelled for regulating the heat of the curing pads, the heating elements of which are easily removed for replacement.—The Akron Tyrwelder Co., division of The Akron Equipment Co., Akron, Ohio.



Akron Electric Tyrspotter

Tire Tread Truck

Handling cut length tire treads from tubing machine or calender to the make-up department is commonly done in short length liners usually arranged as book leaves. A special form of hand truck has recently been developed for handling unvulcanized rubber stock. It is in effect an enormous book on wheels as seen in the illustration. Its over-all dimensions are: length 108¾ inches,



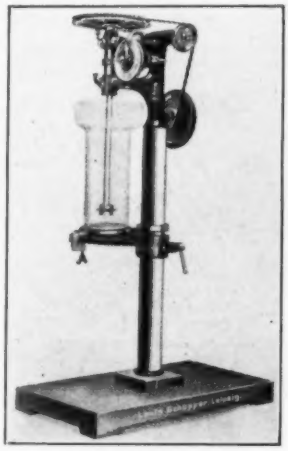
Economic Tire Tread Truck

width 41 inches, and height 46⅜ inches. The truck is fitted with 120 leaves or separating sheets of cloth and has a capacity of 500 treads. The truck is built of steel channel bar and is mounted on castor wheels which facilitate moving the truck from place to place.

The separating sheets are grommeted at three points on one end to hold them in place. To load the truck all the separating sheets are thrown back over the truck frame and drawn singly over each layer of treads as they are placed. This truck affords a far more compact and labor-saving arrangement than the usual books which are relics of a less competitive time than the present.—Economic Steel Rack Co., Everett, Massachusetts.

German Abrasion Tester

The abrasion tester here illustrated is a laboratory machine for determining the wear-resisting value of soft rubber. It is designed for belt drive and consists of a vertical shaft, to the lower end of which a test disk of rubber can be attached and immersed in a glass vessel containing loose abrasive. A revolution counter connected with the driving mechanism is provided for obtaining the record of the speed of abrasion of each sample. Thus any stock may be compared with a standard as to wear either in terms of weight loss or volume loss. The latter is found from the weight lost by dividing this item by the specific gravity of the rubber under test.

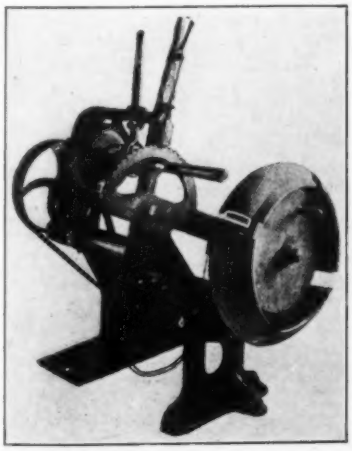


Schopper Abrasion Tester

An instrument of this kind is exceedingly useful as a laboratory instrument for the study of the comparative wearing value of stocks designed for use in the manufacture of tire treads, heels, soles, conveyer belt covers, etc. The results obtainable are of relative value and give data in advance of manufacture.—Louis Schopper, Leipzig, Germany.

Tire Stripping Machine

The boom in reclaimed rubber lends interest to improvements in the machines and appliances for preparing waste tires for the reclaiming process and for salvaging pulled fabric for the manufacture of tire boots, repair patches, etc. A simple and efficient power pulling machine is here illustrated. It is designed for pulling cord or fabric material from debeaded automobile tires.



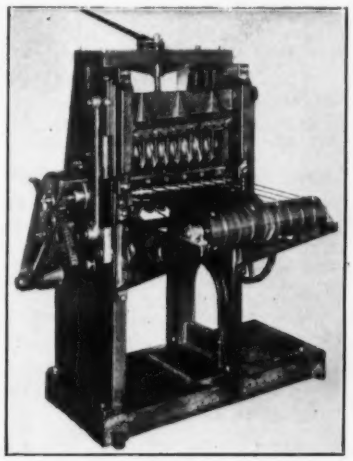
Hibbs' Tire Stripper

The machine is operated from a single horsepower motor or line shaft. It requires but one man to operate it, and will pull one or more plies of fabric or two or more of cord at the rate of 40 to 50 reliners an hour. The tire is held on an expanding drum which is instantly adjustable for circumference by turning a hand crank. The end of the separated ply is pulled by winding up on the pulling shaft which has a forward and backward movement of 12 inches. This brings it close to the tire at the beginning of the operation and allows it to be moved away as the pulled material accumulates on the shaft.

The clutch is of heavy disk type and the driving gears are encased in a strong guard.—Rubber Products Co., Fort Worth, Texas.

Rubber Strip Cutting Machine

The strip cutter here pictured is the newest development in machinery for cutting calendered strip rubber into short pieces of definite length. The machine is of simple design and heavy construction suitable for the hardest service. It is built in 6, 12, 18 and 48-inch cutting widths, and has adjustable cutting lengths ranging from ½-inch up to 120 inches. The stock inlet and outlet can be specially fitted to handle practically every variety of stock. Either wet or dry cutting may be done with the machine. In its design particular attention was paid to secure compactness of the machine, therefore, it can be set near enough to a calender to receive stock directly from it or it may be located in any other place.

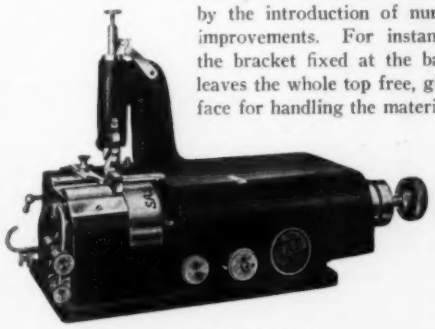


Utility Rubber Strip Cutter

In operation, the sheet stock is conveyed to the series of disk cutters and when cut is taken away on endless bands or belts. The speed of the cutting and the mechanism is arranged to prevent any curling of the strip or sagging of the stock. The machine is motor driven with delivery speed changes arranged to cover the customary working conditions.—Utility Manufacturing Co., Cudahy, Wisconsin.

German Skiving Machine

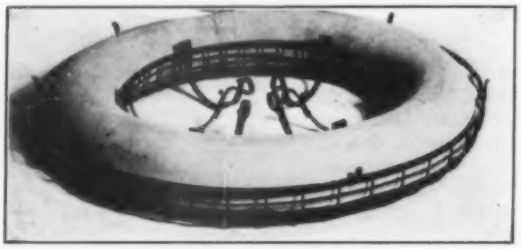
A power skiving machine is a necessity in all rubber or leather work where thinning down edges of stock is done. The skiver here pictured differs from others of its type by the introduction of numerous important improvements. For instance, the shape of the bracket fixed at the back of the frame leaves the whole top free, giving a large surface for handling the material. The absolute stability of the machine is assured by the one piece construction of bracket and body. This feature as well as the steady rotation of the knife shaft is essential to the regularity and perfection of the work produced. The feeding device is readily removable in one piece for the exchange of spare parts. The tension of the feed can be adjusted quickly, according to the work required. The presser foot is quickly raised or lowered by an attachment which facilitates the adjustment and is indispensable for skiving, splitting or grooving to or from any point without starting or finishing at the edge of the material.—Fortuna-Werke, Stuttgart-Cannstatt, Germany.



S. A. S. Skiver and Splitter

Inner Tube Testing Device

Automobilists who must have their tires pumped up every two or three days could, it is claimed, save themselves and service station attendants much loss of time if they were to have their inner tubes put in a Herbst high pressure tube tester. The most



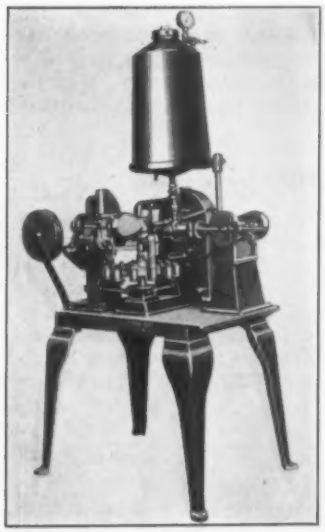
Herbst Tube Tester

insignificant slow leaks quickly reveal themselves when the tube, clamped into this hinged doughnut-shaped wire basket, is blown up and put in a water tank. While two or three pounds pressure may be ordinarily used in the tester, three to five may be applied for a tube smaller than the tester, safely providing ample stretch to show weak spots.

One type made takes 4.40 to 7.30 balloon and 30 by 3½ to 36 by 6 high pressure inner tubes.—The W. B. Herbst Co., 3260 West Tenth street, Los Angeles, California, and distributed by Western "Dri-Cure" Vulcanizer Manufacturing Co., 912 West Pico street, Los Angeles, California.

Rubber Cement Tube Filling Machine

A new and completely automatic machine for filling, closing and clipping collapsible tubes is here illustrated. It is adapted to such materials as rubber cements or any material sufficiently light in consistency to find its level in the tube without trapping air. It is easily adjustable to operate on tubes from ½ to 1½ inches in diameter and from 2 to 6 inches in length. It is so built that the operator is not required to place the clips over the ends of the tubes but does the clip fastening automatically.—Arthur Colton Co., Detroit, Michigan.



Colton Automatic Tube Filler

Gravity Lowering Chain Block

One of the newest and most efficient chain blocks for general factory and warehouse purposes is built of rolled steel plates and forgings, all its working parts operating in oil and grease. The worm has a double thread and is turned from a solid steel shaft, heat-treated, hardened and ground to a glassy surface. Ball bearings take the end thrust of the worm-shaft. The load-chain wheel and worm wheel are in one piece and the worm wheel teeth are cut from the solid. A centrifugal brake on the worm-shaft keeps the lowering speed within safe limits when lowering by gravity. An automatic stop applies the brake as the hook reaches its lowest position and prevents overlowering. In hoisting, only a light pull on the hand chain is required. Lowering can be done in the usual way by pulling on the hand chain which permits extremely accurate movement of the load when desired, or it may be done by gravity. In the latter case the gravity lowering handle is pulled down. This puts the centrifugal brake in charge of the load which is lowered smoothly and rapidly until the lowering handle is released. There is no noise, vibration or jerk in starting or stopping.—Herbert Morris, Inc., Buffalo, New York.

Process Patents

United States

1,624,575. ART OF GALVANOPLASTY. This invention relates to the electro-deposition of irreversible colloids such as rubber, gutta percha, balata and various similar gums, lacs, resins, resinous gums, artificial resins, such as bakelite, nitrated cellulose products, etc. These materials are converted into aqueous dispersions, if not already in that condition, by dissolving them in organic solvents and dispersing them into aqueous colloid form by agitation, mastication through rollers or other well known manner.

Such an aqueous dispersion may be applied as a coating to a water absorbent non-metallic material, such as a piece of wood, woven or knitted fabric, paper or other non-metallic which is not a conductor of electricity. The coating is then rendered electro-conductive by the application to it of a thin layer of graphite, or metallic dust. On this prepared surface metal is electrodeposited.—Arthur Biddle, Trenton, New Jersey, assignor to United Products Corporation of America.

1,624,615 Tire casings. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,624,725 Treating cured inner tubes for pneumatic tires. Frank Fenton, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,625,117 Semisolid tires. Reinhold Gollert, Charlottenburg, Germany.

1,625,122 Tire casings. Ernest Hopkinson, New York, and William J. Steinle, Flushing, both in New York, said Steinle assignor to The Hartford Rubber Works Co., Hartford, Connecticut.

1,625,394 Hollow rubber articles. Fred Thomas Roberts, Yonkers, assignor to Paramount Rubber Consolidated, Inc., Tuckahoe, both in New York.

1,625,395 Hot water bottles, douche bags, etc. Fred Thomas Roberts, Yonkers, assignor to Paramount Rubber Consolidated, Inc., Tuckahoe, both in New York.

1,625,396 Hot water bottles. William E. Roberts, Yonkers, assignor to Paramount Rubber Consolidated, Inc., Tuckahoe, both in New York.

1,625,492 Tire valve casings. Erastus G. Oakley, Southport, assignor to Bridgeport Brass Co., Bridgeport, both in Connecticut.

1,625,508 Laminated packing. Robert Harry Thorne, Williamsport, Pennsylvania.

1,625,582 Flexible hollow articles. Arvid E. Anderson, assignor to Airubber Corporation, both of Chicago, Illinois.

1,625,644 Cushion tire. George F. Fisher, Roselle, New Jersey, assignor by mesne assignments to Morgan & Wright, Detroit, Michigan.

1,625,810 Making a rubber article. Ora Krichbaum, Delaware, Ohio.

1,626,459 Golf ball. William C. Geer, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

Dominion of Canada

270,001 Machinery belt. The Reaney, Ltd., assignee of Russell J. Reaney, both of Ottawa, Ontario.

270,070 Electrical conductor binding method. Paul Friedrich Hellermann, Hamburg, Germany.

270,354 Tire tube. The Goodyear Tire & Rubber Co., assignee of Richard S. Burdette, both of Akron, Ohio, U. S. A.

270,357 Tire. The Goodyear Tire & Rubber Co., assignee of Ross E. Jenkinson, both of Akron, Ohio, U. S. A.

United Kingdom

265,929† Tire. Pirelli & Co., 21 Via Fabio, Filzi, Milan, Italy.

267,048 Connecting uppers to insoles and soles. E. Braun, 46 Stolpiscnestrasse, Berlin, Germany.

†Not yet accepted.

Germany

442,551. Method of producing seamless rubber goods. Dr. Arnold van Rossem, Delft, Holland. Represented by Dr. G. Winterfeld, Berlin, S. W. 61.

442,618. Method of vulcanizing rubber. The Naugatuck Chemical Co., Naugatuck, United States. Represented by Dr. K. Michaelis, Berlin W. 35.

442,619. Method of making rubber with a large number of microscopically small pores. Dr. Hermann Beckmann, Albertinenstrasse 26, Berlin-Zehlendorf.

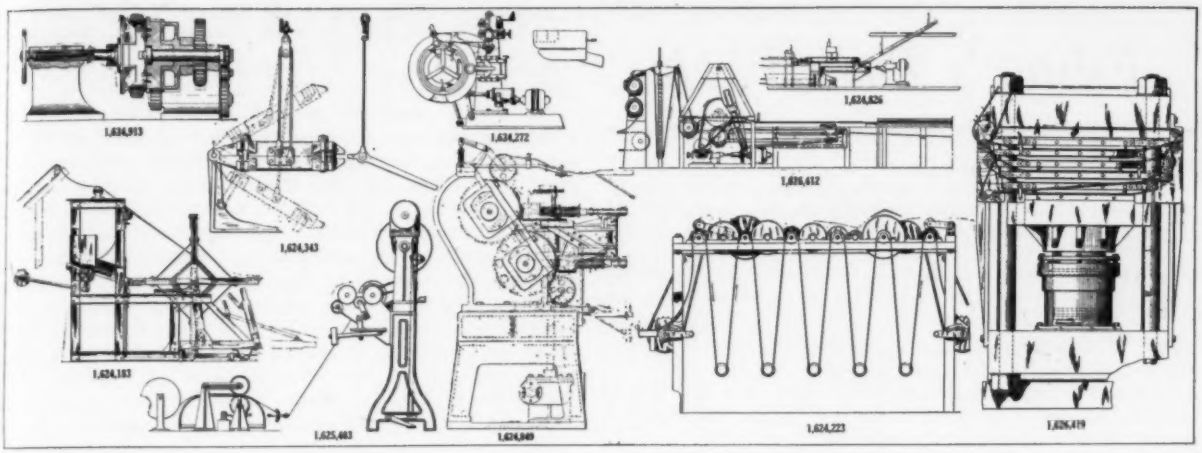
442,757. Method of producing camel hair shoes combined with rubber. Sally Rosenberg and Robert Rötschke, A.-G., Dircksenstrasse 47, Berlin C. 25.

442,856. Method of concentrating the globuloid in rubber latex. Mervyn Stanley Stutchburg, London. Represented by Dr. Carl Böhm v. Börnegg, Bockenheimer, Anlage 45, Frankfurt a. M.

443,005. Method of vulcanization. Société Ricard, Allenet & Cie, Melle, Deux-Sèvres, France. Represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, Frankfurt-a-Main, and T. R. Koehnhorn and E. Noll, Berlin S. W. 11.

443,117. Method of gilding elastic rubber articles. Robert Hahn, Hermann-Vogelstrasse 14, Dresden-Loschwitz.

443,214. Method of producing aqueous rubber dispersions. William Beach Pratt, Wellesley, Massachusetts, U. S. A. Represented by G. Benjamin and H. F. Wertheimer, Berlin, S. W. 11.



Machinery Patents

United States

1,624,183. APPARATUS FOR REELING STRIP MATERIAL. This machine is adapted to reeling long lengths of thin, plastic, sheet material such as unvulcanized rubber. The gum sheet feeding down over the top of the machine is conveyed into the reel where it is wound and spaced apart by separating bars fed in from a chute.—Charles M. Richardson and Zaccheus E. Sargisson, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,624,223. FESTOONING RACK. This apparatus supplies a means in which the festoon supporting rolls may be driven by means other than the fabric, thus avoiding excessive strain upon the latter. The mechanism is adapted for simultaneous in-feeding and out-feeding without changing the lengths of the festoons. Operation is effected by a series of gear trains and rolls under variable conditions of speed ratio and direction.—Willard D. Eakin, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,624,272. APPARATUS FOR WINDING MATERIAL. This invention refers to a machine for making tire carcasses by winding the fabric upon a rotatable core. The fabric is fed over a perforated guide plate and kept from sticking to the plate by a film of air discharged between them. The beads are wound helically in side by side relation and must be progressively rolled in position at opposite sides of the core prior to or at the same time that the body portion of the material is applied.—Howard I. Morris, Lakewood, assignor to The Cord Tire Machine Co., Cleveland, both in Ohio.

1,624,343. MOLD CONSTRUCTION. This is an individual tire mold constructed to be opened and closed easily and occupying a minimum floor space. The molds are combined with a simple operating device so that the two halves or sections of a single mold counterbalance one another.—Frank L. Johnson, Akron, Ohio.

1,624,826. SYSTEM OF MAKING TREADS. This employs an apparatus for forming slab rubber in a continuous length capable of being subsequently cut up into sections for use as tire treads. From the die of an extruding machine the strip rubber passes by belt conveyer through a tank of cooling water, thence to an air cooling conveyer, and finally onto a weighing conveyer.—George W. Bulley, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,624,849. APPARATUS FOR FORMING HOLLOW ARTICLES. Hollow objects, such as balls, are formed by passing two sheets of plastic stock between a pair of rolls bearing on their faces cupped cavities into which each sheet of stock is pressed by a spring actuated hemispherical plunger. On withdrawal of the plungers the cupped stock in the cavities comes together as the cavities of upper and lower rolls register, and the ball thus formed is cut out of the sheet rubber as it passes between the rolls.—Charles W. Steele and Richard T. Griffiths, assignors to The Miller Rubber Co., all of Akron, Ohio.

1,624,913. MEANS FOR UTILIZING RUBBER WASTE. This machine is designed for cutting the soft rubber from the steel bases of solid tires. The tires are held by a screw clamp securely against a gear driven revolving head. As the clamped tire is revolved, a cutting tool is applied tangentially to the rubber by a lever device and the rubber cut away from the base in a strip.—J. W. Ames, Montclair, New Jersey.

1,625,403. FLAP CUTTING AND MEASURING MACHINE. This device forms tire flaps from rubberized strip fabric, perforates the several ends delivering them in measured curved form ready for vulcanization.—Horace D. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,626,412. TUBE MAKING APPARATUS. This apparatus and procedure permits tube blanks to be severed from the continuous strip of stock and fed forward to a tube rolling position, so that each blank will be supported in that position. At the same time the blanks are spaced apart without requiring zones of stock to be cut out between them.—James V. James, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,626,419. STRIP VULCANIZING APPARATUS. In a multiple plate hydraulic press the plates are alternated hot and cold. The hot plates are polished to impart a smooth finish to continuous strip stock which is passed through them. The cold plates are provided with resilient pads attached to their top and bottom surfaces. These pads serve to hold the work against the adjacent hot plates and equalize their pressure without requiring flow on the part of the rubber.—Tod J. Mell, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,624,224. Apparatus for making typewriter key caps, etc. Douglas L. Easterlin, assignor to Linco'n Rubber Key Co., both of New York, N. Y.

1,624,532. Cord guiding device. Martin Castricum, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,624,533. Cord guiding device. Martin Castricum, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,624,544. Fabric feeding device for bead wire covering machines. Charles H. Desautels, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,624,616. Beveling and sealing clamp. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,624,617. Beveling and sealing clamp. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,625,398. Apparatus for making hollow rubber articles. James Schaefer, West Paterson, assignor to Paramount Rubber Consolidated, Inc., Little Falls, both in New Jersey.

1,625,399. Apparatus for making hollow rubber articles. James Schaefer, Yonkers, New York, assignor to Paramount Rubber Consolidated, Inc., a corporation of Delaware.

1,625,894. Flexible gasket for tire molds. Howard O. Hutchens and Charles A. Kessler, assignors to Gillette Rubber Co., all of Eau Claire, Wisconsin.

1,626,039. Machine for placing washers upon the pins of rubber heel molds. Julius H. Kintzele, St. Louis, Missouri, assignor to Dryden Rubber Co., Chicago, Illinois.

1,626,460. Tire spreader. Vernon R. Goeller, Boonton, New Jersey.

1,626,466. Grinding and separating apparatus. William C. Hoover, Roy D. Fritz and Edward Frank Cahill, Akron, Ohio, assignors to The B. F. Goodrich Co., New York, N. Y.

1,626,914. Machine for placing washers on upstanding pins. William H. Brown, Cleveland, Ohio, assignor to Dryden Rubber Co., a corporation of Illinois.

1,627,212. Apparatus for building tire casings. Frank H. Stewart, Philadelphia, Pennsylvania, assignor to Louis B. Eppstein, Jerome Wilzin and J. B. Gordatowski, syndicate managers for The Cum-Art Syndicate, all of New York, N. Y.

1,627,500. Tire spreader. Vernon R. Goeller, Boonton, New Jersey.

Dominion of Canada

270,353 Tire rimming press. The Goodyear Tire & Rubber Co., assignee of Robert W. Snyder, both of Akron, Ohio, U. S. A.

270,355 Airbag. The Goodyear Tire & Rubber Co., assignee of Richard S. Burdette, both of Akron, Ohio, U. S. A.

270,356 Airbag testing tank. The Goodyear Tire & Rubber Co., assignee of Edwin G. Templeton, both of Akron, Ohio, U. S. A.

270,358 Driving mechanism for conveyer belts. The Goodyear Tire & Rubber Co., assignee of Elov F. Maas, both of Akron, Ohio, U. S. A.

United Kingdom

265,708 Tire mold. F. J. Johnson, 811 Longview avenue, Akron, Ohio, U. S. A.

266,142 Vulcanizing apparatus. C. H. R. Collins, 377 Marrickville Road, Marrickville, near Sydney, Australia.

266,885 Tire mold. F. A. Krusemark, Akron, Ohio.

Germany

442.709. Dipping apparatus for producing seamless rubber goods. Albert Boecler, Malmö, Sweden. Represented by Dr. R. Specht, Hamburg.

Design

Germany

982,697 Dipping apparatus for the production of seamless rubber goods or the like. Albert Boecler, Paris. Represented by Dr. R. Specht, Hamburg.

985,498 Device for rolling up tubes, particularly fire hose. Maschinenbau A.-G., Balcke, Frankenthal, Pfalz.

986,939 Mold for retreading tires. Friedrich Theinert, Ruppurrerstrasse 32, Karlsruhe.

Editor's Book Table

"Gottlob's Technology of Rubber." Authorized English Edition Translated and Revised from the German Edition of 1925. By Joseph L. Rosenbaum, 1927. Maclaren & Sons, Ltd., 37 Shoe Lane, London, E. C. 4. Cloth, 350 pages, 7 by 9½ inches. Illustrated. Indexed.

THIS systematic handbook on rubber technology comprises two parts with an introduction on the chemistry of the pure natural rubber hydrocarbon. The first part comprises 13 chapters covering the general technology of rubber. They deal with the origin and preparation of raw rubber, its testing and factory processes of manufacture. The second part includes selected chapters in which the special technology of rubber is discussed by various specialists.

The topics for the first part are: raw rubber, its origin and preparation, rubber latex, washing and drying, resins, physical properties, examination of raw rubber, nature and chemistry of vulcanization, accelerators, properties of vulcanized rubber, aging, analysis of vulcanized rubber, mechanical testing, technical vulcanizing, synthetic rubber.

Topics of the second part under hot and cold vulcanized goods describe manufacturing of mechanicals without textiles, heels and soles, toys, proofed fabrics, tires, shoes, hard rubber, cut sheet and dipped goods.

The book contains 117 illustrations, and is indexed both by subjects and authors. In view of the constant and rapid developments in the rubber industry the work is reasonably up to date and will be found useful by those who desire authentic information on the leading phases and processes of rubber chemistry and manufacturing.

"Rubber and its Uses in Mining." By Mungo Park and B. J. Eaton, O. B. Issued by the Federated Malay States Rubber Propaganda Committee, Kuala Lumpur, 1926. Paper, illustrated, 40 pages, 5½ x 8½ inches.

How rubber has proved of great practical advantage to the mining industry is interestingly set forth in this brochure by Mr. Park, mining engineer, and Mr. Eaton, agricultural chemist. After explaining the properties of rubber in various forms, and how it may be made still more serviceable in one of the oldest and largest of the world's industries, the authors sketch succinctly the development of the rubber industry, with chronological data on the highlights of rubber from Columbus' first reference to it in 1500 to the advent of organic accelerators, and including a table showing the output of all kinds of crude rubber for the various periods in the century between 1825 and 1925.

Other features include a description of the production, preparation, and marketing of plantation rubber, new applications of latex and coagulum, compounding and vulcanizing by the older and the newer processes, the relative merits of various rubbers for specific requirements, how the shock, abrasive, chemical, and electrical resistance of rubber may be best utilized in mining operations, and how the most effective service may be obtained from rubberized bearings, belting, conveyers, dredges, flotation impellers, launders, loading chutes, pipe lining, shafting, tube mills, vanners and classifiers in all ore handling work.

"Standards Yearbook—1927." Compiled by The National Bureau of Standards, George K. Burgess, director. Published by Government Printing Office, Washington, D. C. Cloth, illustrated, 392 pages, 6 by 9 inches.

The ten main divisions of this volume contain much detailed information regarding the development of some of the leading industries and their general trend toward standardization. There are various items included which are of special interest to the rubber trade.

"The Hevea Rubber Tree in the Amazon Valley." By Carl D. La Rue, specialist in rubber investigations. Bureau of Plant Industry. Published by Government Printing Office, Washington, D. C. Paper, illustrated, 69 pages, 6 by 9 inches.

This bulletin represents the third report to be published as a result of the rubber survey made in 1923 and 1924 by the Departments of Commerce and Agriculture. Although this expedition has supplied little that is absolutely new regarding rubber conditions in the Amazon Valley, it has given to the rubber industry much detailed information regarding regions already explored. The author of the bulletin lists some of the difficulties preventing better development of the Amazon basin, the chief hindrance being the lack of cheap and abundant labor. He suggests as improvement certain colonization methods or the importation of Oriental labor, but is doubtful whether the government of Brazil would favor such plans. The twenty-two rubber bearing species of Hevea are listed, but it is admitted that the knowledge of their distribution is imperfect, and none of the species except *Hevea brasiliensis* have been given extensive plantation trials. Brief reports are also included in connection with other kinds of rubber as well as Castilla, Sapium, gutta percha and balata.

"Captains in Conflict—The Story of the Struggle of a Business Generation." By Robert R. Updegraff, with foreword by A. W. Shaw. Published in 1927 by A. W. Shaw Co., Chicago and New York. Cloth, 285 pages, 5 by 8 inches.

This story, "a novel for men at last," as the publishers state, presents a vivid picture of financial conditions during the first quarter of the present century, "the most important period in our business history—when business emerged from the crude rule-of-thumb stage and began to take on some of the attributes of a profession." In telling, in his novel, the story of the lives of the chief characters, Mr. Updegraff has ably touched upon such modern matters as the introduction in business of labor-saving methods, the art of selling goods, the true meaning of advertising, the development of instalment selling, and quantity production, as well as many other questions of interest to the rubber man of today.

"United States Government Master Specification for Hose, Tender (Corrugated)." No. 288. Revised October 28, 1926. Published by the Department of Commerce, Bureau of Standards, Washington, D. C. Paper, three pages, 7 by 10 inches.

This specification, regarding the hose used between a locomotive and its tender, was officially promulgated by the Federal Specifications Board, on October 6, 1922, for the use of the departments and independent establishments of the Government in the purchase of tender hose (corrugated). The technical requirements of this revision became mandatory after January 28, 1927, for all departments and independent establishments of the Government.

New Trade Publications

"Yarway Blow-Off Valves" is the title of an illustrated catalog published by the Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pennsylvania. This thirty-six page catalog contains descriptions of various valves for all working pressures up to 1,350 pounds.

"The Year Book, 1927 Edition," as prepared by The Tire and Rim Association of America, Inc., 1401 Guarantee Title Building, Cleveland, Ohio, contains data of interest and value to the rubber industry.

"Facts and Figures of the Automobile Industry. 1927 Edition." This useful publication contains as usual many items of great importance. It is prepared by the National Automobile Chamber of Commerce, 366 Madison avenue, New York, N. Y.

The Lewis-Shepard Co., Watertown Station, Boston, Massachusetts, specializing in the manufacture of jacklifts, stackers, and steel frame platforms, is issuing its illustrated annual catalog for 1927, "Jacklift and Stacker Practice."

Abstracts of Recent Articles

CADMIUM PIGMENTS. Discusses "Cadmopones," otherwise cadmium lithopones and cadmium sulpho-selenides.—H. W. D. Ward, *Oil & Col. Trades Journ.*, Jan., 1927, p. 269.

DATA ON SPECIFIC GRAVITIES OF CHEMICALS AND MATERIALS USED IN RUBBER COMPOUNDING OR OF GENERAL CHEMICAL INTEREST IN CONNECTION THEREWITH.—Anon., *I. R. Jour.*, April 2, 1927, pp. 544, 586, 668. April 16, 1927, p. 626.

SELECTION OF HIGH YIELDING TREES ON RUBBER ESTATES. Department of Agriculture, Ceylon, Leaflet No. 43. Illustrated.—*I. R. Jour.*, April 16, 1927, pp. 637-8.

THE ELECTRODEPOSITION OF RUBBER.—S. E. Sheppard, *Rubber Age*, N. Y., April 25, 1927, pp. 76-78. Illustrations. Graph.

COMMERCIAL POSSIBILITIES OF THE ANODE PROCESS.—J. W. Schade, *Rubber Age*, N. Y., April 25, 1927, pp. 79-80. Graphs.

RECLAIMED RUBBER. History, development, manufacture and uses.—C. E. Bishop, *Rubber Age*, N. Y., April 10, 1927, pp. 31-32; April 25, pp. 83-84; May 10, pp. 137-138.

SOME TECHNICAL PROBLEMS OF RUBBER MANUFACTURE. Discusses materials, processes and products.—S. S. Pickles, *Rubber Age*, London, April, 1927, pp. 67-70.

SPRAYED RUBBER.—G. H. Gotz, *Rubber Age*, London, April, 1927, pp. 77-78.

TEN YEARS OF CHEMICAL RESEARCH AT MCGILL. A review of the researches made on fats, molecular forces and other physico-chemical work, hydrogen peroxide, asphalt, bio-chemistry and rubber.—G. S. Whitby, *Canadian Chem. & Met.*, April, 1927, pp. 115-119.

RUBBER INDUSTRY HAS NOTABLE PROGRESS. A review covering 25 years of development in the rubber industry.—W. C. Geer, *Chem. & Met. Eng.*, April, 1927, pp. 227-229. Portraits.

THE MECHANISM OF THE ABSORPTION OF WATER BY RUBBER. A systematic study of the rate of absorption and on the final equilibrium of (1) the vapor pressure of the surrounding water medium, (2) the water-sol components of the rubber, (3) the state (liquid or vapor) of the surrounding medium, (4) the combined S (an index of rigidity), (5) the temp., (6) the hydrostatic pressure of the surrounding medium, and (7) the aging of the rubber before and during absorption. The tests were made with cured and uncured rubber, balata and gutta-percha.—H. H. Lowry and G. T. Kohman, *J. Phys. Chem.*, 31, pp. 23-57 (1927).

CHEMICAL PRODUCTS OF THE RUBBER INDUSTRY AND THEIR USE. A general description of compounding ingredients.—T. H. Hewlett, *Rev. Gen. Caout*, 1927, No. 28, 5-8.

EXPERIMENTS WITH G. K. 18 MASTICATOR. Performance tests of a new type of masticator.—H. Feuchter, *Kauts.*, 1927, 35-37.

GUTTA PERCHA AND ITS APPLICATIONS IN THE ELECTRICAL INDUSTRY.—A. Malarmey, *Rev. Gen. Caout.*, 1927, No. 28, 9-13.

RUBBER LININGS. THEIR APPLICATION TO TUBE MILLS AND CHEMICAL VESSELS.—A. M. Munro, *Chem. Eng. Mining Rev.*, 19, pp. 97-99 (1926).

IS THERE A SUBSTITUTE FOR AMERICAN CARBON BLACK?—August Wegelin Co., *Kauts.*, 1927, pp. 47-49.

RECENT IMPROVEMENTS IN RUBBER VULCANIZING PROCESSES. A review.—André Bloc, *Tech. Mod.*, 19, pp. 47-53 (1927).

VULCANIZATION OF RUBBER. Experimental studies.—F. Boiry, *Rev. Gen. Caout.*, 1926, No. 23, pp. 11-13.

VULCANIZATION OF RUBBER WITH SULPHUR.—F. Boiry, *Caout. & G. P.*, 23, 13, pp. 367-8 (1926); 24, 13, pp. 402-3; 13, pp. 438-40 (1927).

EFFECTS OF SOME ORGANIC ACIDS ON THE RATE OF THE VULCANIZATION OF RUBBER. A study of some of the acids in the resin of Hevea rubber and certain other acids with melting points not above the temperature of vulcanization.—P. H. Mitchell, *Caout. & G. P.*, 23, 13, pp. 340-2 (1926); 24, pp. 1340-3 (1927).

RELATION BETWEEN VULCANIZATION IN SULPHUR CHLORIDE VAPOR AND THE SPAN OF LIFE OF THE VULCANIZATES.—Rudolf Ditmar, *Chem. Zeit.*, 51, pp. 26-29 (1927).

NEW PROCESSES CONCERNED WITH LATEX AND RAW RUBBER AT THE SEVENTH INTERNATIONAL RUBBER EXHIBITION IN PARIS. A description of the Hopkinson, Emka, Ripeau, Wilkinson, Utermark, Vultex and Revertex processes.—E. A. Hauser, *Gummi-Zeit.*, 41, pp. 1162-5 (1927).

OBSERVATIONS ON THE FIBER STRUCTURE AND X-RAY INTERFERENCES OF STRETCHED RUBBER. A preliminary paper.—Dr. L. Hock, *Kauts.*, April, 1927, p. 125.

STABILIZATION OF VULCANIZED RUBBER. A paper read at the International Rubber Exhibition, Paris. Practical means for preventing perishing of rubber goods.—Philip Schidrowitz, *Rubber Age*, London, May, 1927, pp. 124-125.

CONCERNING RUBBER SPECIFICATIONS. Abstract of paper May 3 before the Institution of the Rubber Industry.—J. M. Bierer and C. C. Davis, *I. R. Jour.*, May 7, 1927, pp. 749-756.

HARD RUBBER IN THE PREPARATION OF FOOD PRODUCTS.—Anon., *Rubber Age*, N. Y., May 10, 1927, p. 131.

BRITISH AND AMERICAN MACHINE PRACTICE. A comparison with discussion.—A Fraser, *Trans. Inst., Rubber Indus.*, April, 1927, p. 424-34.

CLOTH DYEING FOR RUBBER PROOFING.—H. L. Hockney and C. W. Bancroft, *Trans. Inst. Rubber Indus.*, April, 1927, pp. 435-45.

SET IN VULCANIZED RUBBER.—H. Turner, *Trans. Inst. Rubber Indus.*, April, 1927, pp. 446-59. Graphs.

SOME ELECTRICAL PROPERTIES OF RUBBER. Section 1, a review of present knowledge, data on dielectric resistance; dielectric constance; effects of frequency, temperature and stretching; power factor. Section 2, experimental. Section 3, bibliography and general discussion.—P. Dunsheath.—*Trans. Inst. Rubber Indus.*, April, 1927, pp. 460-487.

SYNTHETIC RUBBERS AND NATURAL RUBBERS. Crystal interferences and form changes of the amorphous rings during the stretching of synthetic rubbers.—J. R. Katz and P. van Campen, *Chem.-Zeit.*, January 22, 1927, p. 53.

UTENSILS AND PAINT THAT WITHSTAND SULPHUR CHLORIDE.—Dr. Rudolf Ditmar, *Gum.-Zeit.*, March 11, 1927, p. 1348.

COMBATING AIR BUBBLES IN SMOKED SHEET.—A. J. Isasca and L. R. van Dillen, *De Bergcultures*, February 26, 1927, pp. 995-997.

THE CONTROL OF CHOLERA ON RUBBER ESTATES.—Sir Malcolm Watson, *Planter*, March, 1927, pp. 228-229.

SOME REMARKS ON THE EXPLOITATION OF EUPHORBIAS IN SOUTH AFRICA; HARVESTING OF RESIN AND LATEX.—Ir. W. Spoon, *De Ind. Merc.*, March 30, 1927, pp. 209-212. Tables, illustrations.

THE SPIRAL STRUCTURE OF RUBBER AND THE SCALE AGGREGATES OF RELATIVE SATURATION CAPACITY. A contribution to the structure problem of the rubber fiber, I.—Dr. Heinrich Feuchter, *Kauts.*, March, 1927, pp. 98-101; April, 1927, pp. 122-124.

CONTRIBUTION TO KNOWLEDGE OF SULPHUR AND TO THE THEORY OF ACCELERATORS, I.—Dr. P. Scholz, *Kauts.*, March, 1927, pp. 101-103. Tables, graph.

ULTRA-MICROSCOPIC STUDIES IN CONNECTION WITH THE VULCANIZATION THEORY, I.—Dr. H. Dannenberg, *Kauts.*, March, 1927, pp. 104-105; April, 1927, pp. 128-130. Illustrated.

X-RAY STUDIES IN METASTYROL.—M. Hünemorder, *Kauts.*, March, 1927, pp. 106-107. Illustrated.

HOW CAN THE STRETCHABILITY OF RUBBER BE EXPLAINED. Review of the problem.—Dr. J. R. Katz, *Gum.-Zeit.*, March 25, 1927, pp. 1459-1460.

RUBBER FOR SEALING TIN CANS.—*Gum.-Zeit.*, March 25, 1927, pp. 1462-1463. Diagram.

PRODUCTION OF RUBBER SOLUTIONS.—*Gum.-Zeit.*, April 8, 1927, pp. 1578-1582. Diagram.

RETREADING WORN PNEUMATIC TIRES AND THE REQUISITE VULCANIZING APPARATUS.—Casper Schmitz, *Gum.-Zeit.*, April 15, 1927, pp. 1636-1637.

PHYSIOLOGICAL CONSIDERATIONS ON THE FLOW OF THE LATEX OF RUBBER PLANTS. I. The mechanism of the latex flow. II. Observations made on rubber plants.—Prof. Dr. A. Zimmermann, *Kauts.*, April, 1927, pp. 118-121.

New Goods and Specialties

Novelty Caps and Bathing Accessories

Cap with Rosettes

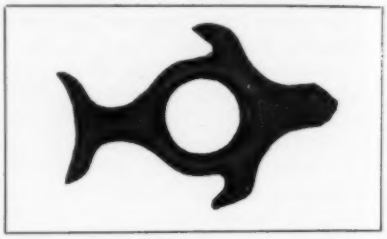
BRILLIANT colors and tints add to the variety of many new designs in bathing caps offered this season to glorify the American bathing girl. The Miller Rubber Co., Akron, Ohio, announces the application of the newest electrical principle in calender roll adjustment that actually measures the thickness of rubber going through the calenders to 1/1000 of an inch and which solves the problem of sheeting rubber to the proper thickness for caps. The Miller line includes caps for sixty different designs and almost as many colors, three of which, the tam o'shanter, butterfly and rosette caps are illustrated.

In the assortment from the Faultless Rubber Co., Ashland, Ohio, are designs to suit the taste of the most captious; for the girl who does her bathing on the beach, or for the athlete who requires a more severe style for her high dives and long distance swims. The colors are distinctive and beautiful, offering a wide range of choice and most attractive color combinations. They have been specially designed for a snug and comfortable fit, amply protecting hair and ears from the water. The tam cap is suited for a full head of hair, the many plaits giving sufficient head room not found in the more close fitting ones used for the bobbed head.

The Faultless Line

The Seamless Rubber Co., New Haven, Connecticut, has developed many new and modish colors that are sure to be in demand. Certain caps are labeled "Brocaid" and are of heavier weight than the ordinary cap, with surface permanently embossed, or brocaded, with a delicate floral design that gives them more the appearance of silk or satin than sheet rubber. Still another style is designated "Duro-Brocaid," as in addition to the brocade surface they have, by virtue of a newly developed method of vulcanization, an unusual degree of strength and durability. They are attractive, bright colored, but thinner than the aviator cap and, the manufacturer claims, more flexible, comfortable, easier to wear and less expensive. One particularly pretty novelty is the matching scarf and cap which, being most becoming, is likely to attain quite a vogue.

To protect the bather from the sun's rays, both while in the water and on the sand, the George P. Kaul Manufacturing Co., 219 West Larned street, Detroit, Michigan, has patented a bathing cap with vizor. The caps are securely reinforced so that there is no possibility of the stitching tearing the rubber. Three styles, Aviator, Diver and Bobie caps are made up in an assortment of fifty different designs which gives to the purchaser a wide variety of choice.



Seal

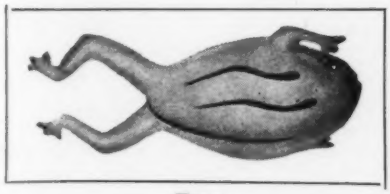
A fine collection of swimming toys is shown by E. A. Guinzburg, 302 Fifth avenue, New York, N. Y. Great fun may be had paddling about on the alligator, sea lion, frog and horse, each of which will bear the weight of an adult and yet when deflated is easily carried in the side of the car. The kiddiefloats are designed for the younger children, these devices being helpful when learning to swim and giving greater freedom to the small tots when in the water. The designs are particularly

Butterfly Cap

Tam O'Shanter

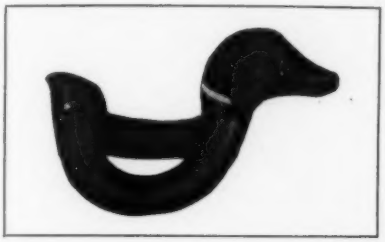
delightful to the youngsters, for who wouldn't be brave and fearless riding with a sea lion, dog or horse.

Two novelty shoes are shown from the same manufacturer which have already established a vogue. One of these is a beach sandal, designed by Lady Edison,



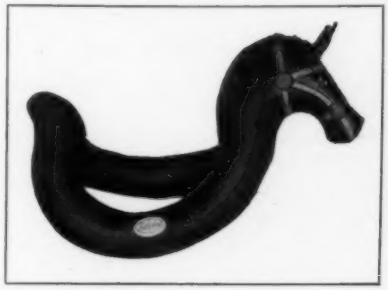
Frog

which is meant as a substitute for the heavy wooden sandal so popular last



Dog

season. The rubber sole and straps make a lighter weight sandal, very flexible and



Small Horse

decidedly less tiring. Another model is a pump made with high wooden rubber covered heel and lined with stockingette. The pump is made with counter and arch support, and could be worn on the street in rainy weather in place of the heavier shoe and overshoe.

Something new in the way of a bathing slipper is a novelty from the I. B. Kleinert Rubber Co., 485 Fifth

Bathing Shoe

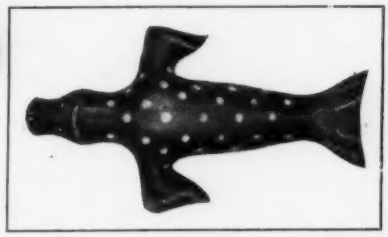
avenue, New York, N. Y. It is molded and made from pure gum which clings tightly to the foot while in the water

Beach Shoe and Sandal

so that the bather may have perfect foot movement with no fear of losing her shoe. The heel is of wood with an outside covering of rubber stock, and helps

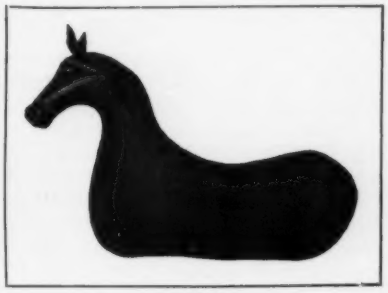
Bathing Cap with Vizor

to make walking easy while on the way to the ocean. The shoes may be ob-



Sea Lion

tained in green, red, black or white, favorite colors for bathing costumes.



Large Horse

The bird of paradise and swan caps made by the Kleinert company are two beautifully embossed models in popular colors.

Three New Models from the Seamless Rubber Co.

Unusual Design for Galosh

In contrast to the neutral, more conservative colors that are prevalent in novelty galoshes, the Converse Rubber Shoe Co., Malden, Massachusetts, has introduced the Frolic, a strikingly different shoe that possesses a strong appeal for those demanding the unusual. It is fashioned from botany sport flannel, a wool fabric that is both fast color and durable, while the light checked fleece lining safeguards milady's hosiery against soiling. The prevailing Frolic colors are red and white, and brown and white plaid, which in combination with

Frolic

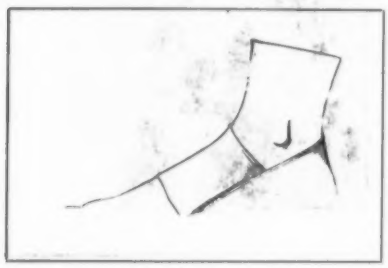
the design typify the trend toward original patterns in novelty footwear.

Rubber Heels Relieve Soldiers' Fatigue

Rubber heels hitherto banned by the Guards, England's crack regiment, as being detrimental to the smart military appearance demanded of them, have, after a twelve months' trial, been sanctioned by the officers in charge. It has been found that rubber aids the soldier in marching and lessens the fatigue which modern road construction induced, and less fatigue means greater efficiency.

Arch Support

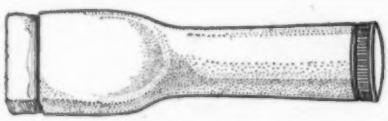
Indispensable to all who stand much or indulge in athletic sports, the arch support protects the balls of the feet and toes against pressure from the shoes. Fatigue, turning or spreading of the feet is relieved almost immediately, and the step gains in elasticity and lightness. The support is flesh-colored and is invisible when worn under the lightest weight or color of stocking.—Hansa-Vertrieb, Joseph May, Holzgrabenstrasse No. 2, Frankfurt a.M., Germany.



May Supporter

To Moisten Gummed Articles

A real time and trouble saver which will speed up the moistening of gummed labels,

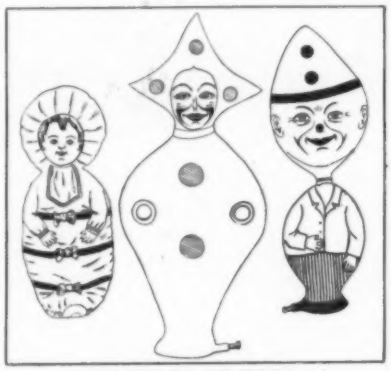


Corker Damper

envelopes, etc., is manufactured by Rogers Brothers, 6, Fox Court, Holborn, London, E. C. 1, England, under the name Corker damper. Made of a fine quality of rubber tubing and felt, it is hygienic, unbreakable and inexpensive. Before using, remove the cork from the rubber holder and fill with water. A slight pressure will saturate the felt, the greater the pressure the greater the flow of water. This device is made in two sizes; the handy for envelopes, stamps, etc., and the giant parcel label size for large surfaces.

Inflated Toys from Germany

A clown who bobs his head and holds his hands in his pockets, and a smiling little gentlemen who nods tirelessly are two of the novelty inflated toys manufactured by "Vulkan" Gummiwarenfabrik Weiss &



Colored Rubber Dolls

Baessler, A-G, Leipzig W. 33, Germany. The clown's costume is in red and green with large buttons of yellow, while the little man is garbed in dark blue with a red and white cap. A third doll is a little papoose baby in black and white with hood and bib, which remains inflated without the use of a valve. Dolls of this character are extremely popular, particularly for infants and very young children, because they may be thrown and knocked around without fear of bodily harm, and, the colors being absolutely fast, they may be washed when soiled.

Gum Patch

A serviceable patch, manufactured by The Medina Rubber Co., Medina, Ohio, is made with a heavy layer of cushion gum, which is self vulcanizing and water tight. The same company also markets a cement boot, which has a heavy coat of cement. A large piece of gum is included to fill in casing breaks.

Children's Novelty Boot

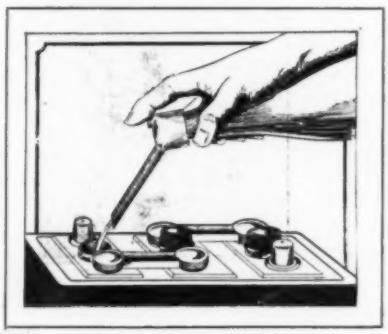
A lightweight, flexible boot with good wear and neat appearance, is an attractive and extremely practical novelty for the younger folk. It is made to be worn over the shoes, felt insoles providing extra warmth. The boot is easily put on and taken off, and may be rolled into a small

Nursery Design Boot

package when not in use. The nursery designs appeal to the kiddies and no persuasion is necessary when cold, wet days come to have them properly equipped for such weather.—Hood Rubber Products Co., Watertown, Massachusetts.

Filler for Storage Battery

A new device which will save table tops, rugs and furnishings from being ruined by the slopping over or spilling of electrolyte while filling a battery is called the Handy Battery Filler. It is particularly useful for radio batteries at home, and also fits the top of any distilled water bottle. The flow is controlled by the finger tip on the air vent. —The Pierce-Roberts Rubber Co., Trenton, New Jersey.



Handy Battery Filler

Financial and Corporate News

New Capital for Canadian Goodrich

CANADIAN GOODRICH CO., LTD., Kitchener, Ontario, has recently completed capital reorganization of a major character. Holders of income bonds have waived arrears of interest amounting to $220,206, and have agreed to make the interest non-cumulative until July 1, 1930. Holders of preferred stock have waived arrears of dividend amounting to $63,000 on December 31, 1926, and have agreed to the cancellation of the preferred stock, receiving one share of new no-par common for each share of preferred. Common shareholders will receive one share of new no-par common for every twenty shares held. Total no-par common authorized is 100,000 shares.

With the adoption of the plan the Goodrich company of Akron, will supply over $1,250,000 in new capital, taking therefor no-par common shares on the basis of $25 a share. Under the new capital structure, with the deficit and arrears wiped out and working-capital on a sound basis as a result of the new capital advanced by the American company, the Canadian company looks forward to the fuller achievement in the near future of its strong position in the industry.

U. S. Shoe Machinery Corp.

The United Shoe Machinery Corporation, Beverly, Massachusetts, manufacturer and lessor of rubber and leather shoe machinery, reports for 1926 net profits of $8,810,040. After deducting reserves for federal income taxes of $825,000 and preferred stock dividends the balance was equal to $3.78 a share on the $48,534,891, par $25 common stock. This compares with a net of $8,050,920 equal to $3.82 a share in 1925.

The report says: "The volume of business has been in excess of that of the preceding year. Upon this greater volume, however, a slightly reduced percentage of profit was realized, owing to the reductions made during the year in terms for the use of certain leased machines, and in sale prices of machine parts and other commodities.

"The earnings, with the income received from subsidiary companies both foreign and domestic, after deducting dividends paid, have increased surplus account $556,121, compared with an increase of $622,291 last year.

"The corporation requires and has maintained liberal liquid assets for the protection of its wide activities. Merchandise inventories are in as small a volume as is consistent with the demands of the business. Plants and equipment are in splendid physical condition and proper depreciations have been charged off. There are no debts, other than current accounts.

"Manufacturing conditions have been satisfactory during the year. The business of the foreign subsidiaries has been in good volume, with conditions in certain countries gratifyingly improved. We look forward to continued improvement."

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
American Chicle Co.	Com.	$0.75 q.	July 1	June 15
American Chicle Co.	Prior pfd.	$1.75 q.	July 1	June 15
American Chicle Co.	6% pfd.	$1.50 q.	July 1	June 15
Boston Woven Hose & Rubber Co.	Com.	$1.50	June 15	June 1
Boston Woven Hose & Rubber Co.	Pfd.	$3.00	June 15	June 1
General Tire & Rubber Co.	Com.	2% q.	May 1	Apr. 20
Goodyear Tire & Rubber Co.	8% pr. pfd.	2% o	July 1	June 13
Goodyear Tire & Rubber Co.	7% cum. pfd.	$1.75 q.	July 1	June 1
Hood Rubber Co.	7½% pfd.	$1.88 q.	May 1	Apr. 21
Hood Rubber Co.	Prior pfd.	$1.75 q.	June 1	May 20
Miller Rubber Co.	Pfd.	$2.00 q.	June 1	May 10

Akron Rubber Stock Quotations

Quotations of May 19, supplied by Otis & Co., Cleveland, Ohio.

Company	Last Sale	Bid	Asked
Aetna com.	17	..	20
Aetna pfd.	95	..	97
Falls com.	4½	..	..
Falls pfd.	7	..	15
Faultless com.	38	38	39
Firestone com.	131	130	131
Firestone 1st pfd.	106	106	..
Firestone 2nd pfd.	101¾	101½	102
General com.	150	145	..
General pfd.	102½	105	110½
Goodrich pfd.	100	..	..
Goodyear com. V. T. C.	56¼	52	..
Goodyear pfd. V. T. C.	117¼	..	..
Goodyear pr. pfd. V. T. C.	109	..	..
India com.	27½	27	30
Miller com.	34	..	..
Miller pfd.	102¼	102	102½
Mohawk com.	15	..	..
Mohawk pfd.	40	35	..
Seiberling com.	28	29	30
Seiberling pfd.	100	100	..
Star com.	2	..	3

New York Stock Exchange Quotations

May 23, 1927

	High	Low	Last
Ajax Rubber, com.	9¾	9⅝	9¾
Fisk Rubber, com.	17⅛	17	17
Goodrich, B. F., Co., com.	56¼	55¾	56¼
Goodyear Tire & Rubber, pfd. (7)	116⅝	116	116
Goodyear Tire & Rubber, pr. pfd. (8)	111¼	111¼	111¼
Kelly-Springfield Tire, com.	23¼	22½	23
Keystone Tire & Rubber, com.	½	½	½
Miller Rubber, com. (2)	32½	32	32
Norwalk Tire & Rubber, com.	3½	3⅜	3½
United States Rubber, com.	51⅝	50⅜	51⅝
United States Rubber, 1st pfd. (8)	103⅜	103	103

New Incorporations

THE CIRCLETTE MANUFACTURING CO., INC., May 5, 1927 (Massachusetts), capital $100,000. Incorporators: Frank J. Ford, 18 Townsend street, Worcester; Thomas F. Rhodes, Newton Highlands; Agnes C. Ford, 18 Townsend street, Worcester; David J. Donahue, 150 Congress street, Boston, all in Massachusetts. Principal office, Worcester, Massachusetts. To deal in rubber, rubber goods, knitted, woven and elastic goods.

GILBERT TIRE & RUBBER CO., February 28, 1927 (Colorado), capital stock $10,000. Incorporators: John E. Rugg, J. Ivan Gilbert and Joseph E. Wilmore, all of Denver, Colorado. Principal office, Denver, Colorado.

HANOVER RUBBER CO. EXCELSIOR, INC. (New York), capital $20,000, 200 shares par value $100. Incorporators; G. Herbert Semler, James W. Husted, Jr., and Hayden N. Smith, all of 32 Liberty street, New York, N. Y.

HENDRY BROTHERS PATCH CO., April 9, 1927 (New Jersey), capital stock $25,000. Officers: A. R. Hendry, president; Charles Hendry, secretary; Curt Zoerner, treasurer. Principal office, Passaic, New Jersey. To manufacture tire patches.

K. & S. RUBBER CO., LTD., March 17, 1927 (Canada), capital stock 10,000 shares without nominal or par value. Incorporators: Sydney Ellis Wedd, Bruce Victor McCrimmon, Cyril Frederick Harshaw Carson, John Gowans Middleton, Samuel Davidson Fowler, Edward Philip Tilley, Anna Latimer, Elizabeth Fraser and Revena Kelly, all of Toronto, Ontario, Canada. Principal office, Toronto, Canada. To manufacture tires, rubber, rubber goods, gutta percha, tires, tubes and accessories.

KERRIGAN ELASTIC WEBBING CO., March 2, 1927 (New Jersey), capital stock $125,000. Incorporators: Otto F. Ochsner, 361 Hudson avenue, Union City; Herbert C. Thiebaud, 18 Adelina Place, North Bergen; Irwin R. Heller, 972 Broad street, Newark, all in New Jersey. Principal office, 381 Summit avenue, Union City, New Jersey. To manufacture elastic webbings.

KING LABORATORIES, INC., February 28, 1927 (New Jersey), capital stock $125,000 divided into 12,500 shares of $10.00 par value. Incorporators: Charles W. Leebel, 302 Greylock Parkway, Belleville; Frederick G. Turck, 295 Greylock Parkway, Belleville; Beatrice M. Campbell, 97 North 13th street, Bloomfield, all in New Jersey. Principal office, 117 Roosevelt avenue, Belleville, New Jersey. To deal in rubber, gutta percha, etc.

MALDEN TIRE REBUILDING CO., April 6, 1927 (Massachusetts), capital $25,000. Incorporators: Harold K. Weathers, 47 Porter street, Melrose; Loren H. Blinkhorn, 7 Marion avenue, Woburn; Charles E. Dodge, 105 High street, Everett, all in Massachusetts. Principal office, 31 Irving street, Malden, Massachusetts. To manufacture and deal in automobiles, bicycles, tires and various parts and accessories.

PERFECTION RUBBER CO., LTD., May 4, 1927 (Canada), capital stock 2,500 8 per cent cumulative preferred shares of $100 par value each, and 15,000 common shares without nominal or par value. Incorporators: Hugo Wellein, Bruce Card, Elsie Chappell, and Lorne Muir Coughtry, all of Montreal, Quebec, and Frederick Everette Partridge, Guelph, Ontario, all in Canada. Principal office, Montreal, Quebec, Canada. To deal in all forms of rubber manufacturing and any or all products of rubber.

T. C. ROHREY CO., INC., (New York), capital $10,000, 100 shares of $100 par value. Incorporators: J. C. Rohrey, Edwin T. Kenlon and Joseph F. McCarthy, all of 50 East 42d street, New York, N. Y. To deal in rubber, gutta percha, caoutchouc, etc.

WALLACE HEEL CORPORATION OF AMERICA, May 7, 1927 (Delaware), capital 10,000 shares without nominal or par value. Incorporators: Mark W. Cole, James H. Hughes, and James L. Wolcott, all of Dover, Delaware. Principal office, Dover, Delaware. To manufacture heels.

Obituary

Former Executive of Peerless Rubber Mfg. Co.

On May 8 William Hillman, formerly vice president and general manager of the Peerless Rubber Manufacturing Co., died in Grand Rapids, Michigan, at the home of one of his sons, Lemuel S. Hillman. For the past three years the father has been making his home in West Palm Beach, Florida, where he had organized the Hillman Concrete Tile Corporation.

William Hillman

William Hillman was born August 9, 1861, in New York City, where he was educated and where he spent his boyhood. His first business association was with the Union Nut Co., while in 1887 he became connected with the Revere Rubber Co. of Boston, first as salesman and later as manager of the organization's New York branch. In 1908 he joined the forces of the Peerless Rubber Manufacturing Co. of New York as vice president and general manager, remaining with that concern for several years. In 1904 Mr. Hillman was elected secretary-treasurer of the Mechanical Rubber Manufacturers' Association, he being the first to hold that position.

For about forty years Mr. Hillman was a resident of Mount Vernon, New York, where he took an active interest in civic affairs. For several years he was a member of the town's board of education. The various clubs and societies with which he was connected included the following: Union League, Hardware, Republican, and Quill clubs of New York City; the Japan Society, the New England Society, the Huguenot Society, also of New York City; and the John Steuart Lodge of the Masonic order of Mount Vernon. Mr. Hillman was deeply interested in the work of the Baptist Church, and was a trustee of the Baptist Educational Society of New York State.

He is survived by his three children, two sons, Lemuel S. and William Hillman, Jr., and a daughter, Mrs. Alice H. Jones.

Founder of Williams Foundry & Machine Co.

John K. Williams, founder and former president of the Williams Foundry & Machine Co., and since 1922 first vice president of the Franz Foundry & Machine Co., both of Akron, Ohio, died on May 9. Mr. Williams, who was seventy-one years of age, is said to have been suffering for some time from poor health. Because of this failing health he had been taking less active part in business recently, although continuing as a director of the Williams organization.

He was widely known as an inventor and manufacturer of rubber machinery, and had the distinction of making the first mold and core equipment for the earliest tire manufacturers of Akron, including Dr. B. F. Goodrich, founder of The B. F. Goodrich Co. In 1918 Mr. Williams sold his interests in the Williams Foundry & Machine Co., which he had established in 1901, joining the Franz organization, where he was associated with M. C. Franz, former secretary of the Williams organization.

Mr. Williams was a member of the Masons and Odd Fellows. He is survived by his widow, a sister, and a nephew, Lloyd Williams, the latter having been for some time president of the Williams organization.

President of the Safety Cable Co.

The many business and personal friends of LeRoy Clark, president of the Safety Cable Co., heard with deep regret of his death on April 18. The loss is keenly felt by the executives and operatives of the Safety organization, Mr. Clark having been its president for the past twenty-one years, while he has been associated with the company in various capacities throughout his entire business career.

He was born in New York City, February 16, 1872, and received his education in the Columbia Grammar School and Columbia University, being graduated from the Columbia School of Mines in 1894. Immediately after his graduation he began work with the Safety Insulated Wire & Cable Co., the predecessor of the present Safety Cable Co., holding successively the positions of electrician, treasurer, and vice president. On January 1, 1906, he was elected president of the organization, and continued to hold that position until the time of his death. In 1925 the Safety Cable Co. took over the properties of the Phillips Wire Co., of Pawtucket, Rhode Island, and the A. A. Wire Co., of Harrison, New Jersey, while just previous to Mr. Clark's death the announcement was made of the acquisition of the American Insulated Wire & Cable Co. and the Brenner-Mervis Co., both of Chicago.

During the World War Mr. Clark served as chief of the Wire and Cable Section of the War Industries Board, in which capacity he had charge of the government's wire and cable orders. He was also actively interested in association work, to which he devoted much of his time and energy. The clubs and various associations with which he was connected include the following: Columbia Alumni, School of Mines; American Institute of Electrical Engineers; National Manufacturers' Association; American Engineering Standards Committee; Electrical Manufacturers' Club; Engineers' Club; Lawyers' Club; and the Knickerbocker Golf Club, Englewood, New Jersey.

Prominent Rubber Broker

The sudden death on April 27th of Lucien P. MacMichael, a prominent rubber broker, was a shock to his many friends in the rubber industry. Mr. MacMichael resided at 255 West 88th street, and conducted his business at 2 Stone street, New York, N. Y. He was a member of the Wheatley Hills Golf Club at East Williston, Long Island. His wife and two daughters, Mrs. H. Gilbert Smith and Mrs. William Martin, survive Mr. MacMichael, both the daughters being residents of Brooklyn.

AMERICAN RUBBER TRADE IN 1926

The export and import business of the United States during 1926 is clearly reviewed in *Our World Trade*, a bulletin issued by the Chamber of Commerce of the United States, Washington, D. C. In this publication, crude rubber, including latex, holds a conspicuous place, as its import value, at $505,818,000, constituted 11.4 per cent of this country's entire import trade. It also showed a gain over 1925 of 17.7, while the quantity imported, or 925,878,000 pounds, was 4.2 per cent greater than in 1925, and 824.2 per cent more than during the prewar period. The average price of rubber during 1926 was 6.3 cents higher than that of the preceding year, although during the twelve months the price declined steadily.

Exports in 1926 of rubber goods showed in general a gain, although shipments of tires and inner tubes declined in quantity by 8.4 per cent and 23.6 per cent, respectively, as compared with 1925. The value, however, of automobile tire exports was $27,816,000, an advance for 1926 of 14.8 per cent over the year preceding. Rubber boot and shoe shipments, at $7,792,000, meant a gain of 22.4 per cent over 1925, the figure for quantity being also 19.7 per cent higher. Waterproofed automobile cloth and rubberized fabrics also showed a quantity advance of 18.9 per cent, while exports of reclaimed, old and scrap rubber, 41,918,000 pounds, value $3,372,000, reached record figures in both quantity and value. Shipments of cotton cloth, including duck and tire fabric, declined, however, by 12.3 per cent.

The Rubber Industry in America

New York

Singmaster & Breyer, 1640 Graybar Building, 420 Lexington avenue, New York, N. Y., opened offices on May 1 as consulting engineers, the concern having been organized by J. A. Singmaster and F. G. Breyer, both connected for a number of years with the New Jersey Zinc Co. The heads of the new consulting company have a wide acquaintance in the rubber trade and a broad knowledge of the problems met with in the paint, rubber and plastic industries.

The Safety Cable Co., 114 Liberty street, New York, N. Y., acquired in March of the present year the interests of the Brenner-Mervis Co. and the American Insulated Wire & Cable Co., both of Chicago. In 1925 the plants of the Phillips Wire Co., Pawtucket, Rhode Island, and the A. A. Wire Co., Harrison, New Jersey, were also consolidated with the Safety properties, the result being that the enlarged concern now has practically a complete line of both bare and insulated wires and cables. Walter F. Field has been recently elected president of the Safety Company, succeeding the late LeRoy Clark.

Charles T. Wilson Co., specializing in crude rubber and foreign produce, has moved its offices from 82 Beaver street to 44 Beaver street, New York, N. Y.

The United States Rubber Co., 1790 Broadway, New York, N. Y., created a new office at its recent annual meeting, that of executive vice president. Homer E. Sawyer, for a number of years vice president of the organization, was appointed for the new position.

The American Hard Rubber Co., 11 Mercer street, New York, N. Y., is making some alterations in its buildings at College Point, Long Island, New York, and is also replacing old boilers with new ones. E. S. Boyer is president.

E. M. & F. Waldo, Inc., manufacturers and importers of dry colors and black and white pigments used by the rubber industry, changed on May 1 their office location to 244 Fifth avenue, New York, N. Y.

George F. McVeigh will be the representative for The Columbus Tire & Rubber Co., Columbus, Ohio, in New York and New Jersey, and will make his headquarters in New York City.

The Rubber Trade Association of New York, Inc., announces that on and after May 16, 1927, its offices will be at 89 Broad street, New York, N. Y.

C. Francis Beatty, for the past four years associated as advertising manager with The New Jersey Zinc Co., is now with the E. J. Ross Advertising Agency, 119 West Fortieth street, New York, N. Y. Mr. Beatty is a member of the American Zinc Institute and has been on the executive board of the Association of National Advertisers.

V. G. Thomas has resigned as vice president of Wishnick-Tumpeer, Inc., New York, N. Y., manufacturer and distributer of rubber chemicals and colors. For a number of years Mr. Thomas was in charge of the New York office of L. H. Butcher Co., this organization having been consolidated last August with the Wishnick-Tumpeer concern.

Mr. Thomas, who is well known in the rubber industry, announces that he will continue business under the firm name of V. G. Thomas & Co., with offices at 99 John street, New York, N. Y.

New York Rubber Corp.

The New York Rubber Corporation, which succeeds the New York Rubber Co., Inc., of Beacon, New York, has no affiliation with any other concern, is amply financed, has a thoroughly experienced staff, and is now manufacturing at Beacon. The corporation is therefore in a position to expand its business along broad lines in keeping with the reputation for high quality mechanical rubber goods which it has maintained for more than a half century.

Executives of the corporation are: Morgan W. Jopling, president; L. D. Bigelow, vice president and general manager, in charge of factory and sales; W. G. Andrews, second vice president; P. D. Ash, treasurer, and D. R. Hyde, secretary. The executive and sales offices are located at the plant in Beacon with new branch offices at 25 West 43rd street, New York, N. Y., and in other important centers. The lines of manufacture include belting, hose, packings, dredging sleeves, diaphragms, pump valves, other mechanical rubber goods and radio insulation materials.

J. Edwin Davis, well known in the mechanical rubber goods trade as a rubber executive, has joined the sales organization of the New York Rubber Corp. as manager of its print-rubber department.

Edwin S. Davis is chief chemist in charge of the laboratory of the New York Rubber Corporation, Beacon, New York.

The Endicott Johnson Corp., Johnson City, New York, reports increased shipments of 611,000 pairs of leather shoes and 325,000 pairs of athletic footwear for the first four months of this year compared with 1926. President George F. Johnson states that plant capacity for rubber soled footwear will be increased by 25,000 pairs daily with an annual sales valuation of $8,000,000. Construction of a new five-story brick and steel factory employing 1,000 additional workmen, will begin immediately. The corporation's present rubber footwear production amount to $7,000,000 yearly.

Pennsylvania

The Wolverine Supply & Manufacturing Co., 1200 Western avenue, N. S. Pittsburgh, Pennsylvania, includes in its products a line of toys, and in order to increase its output has purchased the entire line of goods produced by the Walbert Manufacturing Co., of Chicago. One of the games in which the latter company specialized made use of rubber horseshoes for gym exercises. C. C. Bain is president of the Wolverine organization.

John C. Witmer of Harrisburg, Pennsylvania, has been spending a few days at the factory of the Falls Rubber Co., Akron, Ohio, accompanied by the organization's eastern Pennsylvania representative, H. L. Walters.

SOVIET UNION DELEGATES

A visit to this country of delegates from the Rubber Trust of the Soviet Union has been announced by the Amtorg Trading Corp., 165 Broadway, New York, N. Y. These Russian representatives are interested in machinery and production methods, as exemplified by the American rubber industry. Two of the five big rubber plants of Russia have not been in operation since the war, the remaining three however having been brought back to the pre-war rate of output. Their production last year showed a gain of 30 per cent over 1925, the 1926 totals including 27,000,000 pairs of galoshes, and tires valued at $5,000,000. During 1926 the Rubber Trust also used 7,000 metric tons of crude rubber, while this year 9,000 tons will be imported.

New Jersey

While the mechanical end of the rubber industry in New Jersey remains very good, the tire and tube divisions are not yet up to capacity. Manufacturers are looking forward to better conditions within the next few weeks. Plants manufacturing belting and hose are running to capacity on these lines. Hard rubber business has not shown much improvement during the past month.

Trenton rubber manufacturers and employes donated liberally to the Mississippi flood cause. The majority of the manufacturers sent checks for large sums and many collections were taken among the employes.

The Essex Rubber Co., Trenton, New Jersey, specializes in rubber heels and soles, but lately received increased orders for various kinds of rubber supplies for the automotive trade. The concern is now manufacturing rubber flooring for various makes of cars and the plant is running normally. President C. H. Oakley states that the past month has shown a larger increase in business than during the past several months.

The Murray Rubber Co., Trenton, New Jersey, announces that it is operating at capacity on mechanical rubber goods and about 75 per cent of capacity on tires and tubes.

The United Rubber Machinery Exchange, formerly at 311-317 Mt. Pleasant avenue, Newark, New Jersey, is now located at 319-323 Frelinghuysen avenue, Newark.

The United & Globe Rubber Co.'s plant and equipment, at Trenton, New Jersey, was sold some months ago at receivers sale for $118,000 to State Highway Commissioner Abraham Jelin and United States Marshal Frederick K. Schneider, both of New Brunswick, New Jersey. Title to the property has been given to the new owners by the receivers, Colonel Edward C. Rose and J. Philip Bird. With the exception of sixteen suits involving claims against the United & Globe, this transfer winds up the affairs of the receivership.

Title to the Bergougnan Rubber Co.'s plant, Trenton, New Jersey, has passed from the Bergougnan Realty Co., to George E. Goldbeck, Jr. The consideration was not announced, although the property was held at $200,000. The purchase includes real estate amounting to more than nine acres and the factory buildings, the replacement cost of which is said to be in excess of $500,000.

Whitehead Brothers Rubber Co., Trenton, New Jersey, is very busy at the present time. Orders have increased to such an extent that the hose and belting departments are on an overtime basis. The company is now doing better than it has for three years.

The Vulcanized Rubber Co., Morrisville, Pennsylvania, reports that business has been falling off to some extent. The condition is believed to be due to an overproduction of radio parts.

Connecticut

J. W. Whitehead, sales manager of The Norwalk Tire & Rubber Co., Norwalk, Connecticut, has returned from a business trip to the Pacific Coast and Middle West. While away he held conferences with the company's salesmen and distributers in the cities of San Francisco, Los Angeles, Tulsa, Kansas City, St. Louis, and Chicago.

Ajax May Curtail Trenton Activities

The Ajax Rubber Co., Inc., announces that due to loss of production at Trenton in previous years during the hot weather, when demand is greatest, the company has made preparation during the winter and spring months to take care of the peak demand during the spring and summer season, and may find it more economical to curtail or temporarily discontinue production at Trenton, but in case of such action, it is expected to be only of temporary duration.

The present new activities at Racine involved the erection of a building for warehouse, additional office space and added production purposes, as well as the installation of labor-saving devices, all for the purpose of reducing production costs.

Executive offices will be continued in New York, but at a later date some departments now a part of the New York organization will probably be removed to Racine for the purpose of organization efficiency and overhead savings.

Annual Dinner of Farrel Veterans

The annual meeting and banquet of the Veterans' Association of the Farrel Foundry & Machine Co., Ansonia, Connecticut, was held on the afternoon of May 14 in the Masonic Temple at Ansonia. The organization consists of employes who have been associated with the Farrel concern for twenty-five years or more, there being at present 116 members on the list, thirty of whom are pensioners. The president of the association, William Bowen, has been with the Farrel company for fifty-five years, another has a record of fifty years, and several others forty years.

The Farrel Foundry & Machine Co. has a noteworthy history, having been established in 1848 by Almon Farrel and his son Franklin Farrel. The products first included power drives and gears for installations which, at that time, ran by water power. Gradually the output was extended to include calenders and other roll operating mechanisms, rubber machinery, etc. Meanwhile the factory buildings also grew from a small plant on the banks of the Naugatuck River to the present large concern at Ansonia of thirteen and a half acres, with a branch plant at Buffalo, New York, which has three-quarters of the main plant's capacity.

Farrel Foundry & Machine Co., Ansonia, Connecticut

It is an interesting fact that when the Farrel organization was first established it was necessary to import chilled iron rolls from Great Britain, but before the death of Franklin Farrel the situation was reversed, and today the Farrel machinery and rolls are exported to many countries and are known throughout the world.

Massachusetts

Rubber mill activity in Massachusetts continues to present evidences of a mixed trend, although the general average as revealed by the official state figures shows a slight decline. Tires, tubes, and mechanicals for the automotive industry are busy, footwear mills normally active, while insulated wire, industrial rubber mechanical goods, heels and soles, and sundries are slightly below normal. State figures for the month of April show that employment in rubber footwear declined from 8,792 to 8,628 with 1,603 on part time. In rubber goods, including tires and tubes, there was also a decline from 2,835 to 2,751, while average wages in footwear increased from $25.04 to $25.60, and in rubber goods from $24.99 to $25.69. General employment index compared to the average of 1919-1923 shows rubber footwear at 97.0, a decrease from 98.8 of the previous month, and rubber goods, tires, and tubes at 122.5 an increase from 119.1 in March. The Federal Reserve Bank of Boston reports that rubber footwear sales in March declined from the large volume of March last year.

E. D. Manley, manager of the Boston branch of the Firestone Tire & Rubber Co., Akron, Ohio, reports the appointment of A. M. Sneddon as assistant branch manager. Mr. Sneddon needs no introduction to the automotive trade of Boston, as for the past two years he was office manager of the local office. Before coming to Boston Mr. Sneddon was office manager of the company's branches at Buffalo and New York. He was also identified with the automotive industry for several years, having been associated with the Packard Motor Car Co., General Motors Corp., and the Detroit Truck Co. at their home office in Detroit, Michigan.

Arthur H. Hadley has been appointed New England sales representative for the St. Louis Cement Co.'s line of rubber cements for the shoe and leather trade. He will call on the trade in the New England territory with his firm's products, making his headquarters at Marblehead, Massachusetts.

The Eastern Massachusetts Section of the Taylor Society held a meeting at the Boston Chamber of Commerce on May 17, when the Bedaux Point System was the subject under discussion, and Edwin C. Johnson, president of the H. A. Johnson Co., Boston, presided. Speakers were: L. C. Stevens, president of the L. C. Stevens Co., Boston, Massachusetts; C. W. F. O'Connor, production manager of the Universal Winding Co., Providence, Rhode Island; and Aldo P. Greco, head of the standards department, Simonds Saw and Steel Co., Fitchburg, Massachusetts.

W. T. Lewis, purchasing agent of the Firestone Tire & Rubber Co., Akron, Ohio, is in Singapore on a six months' business trip.

George E. Price, Jr., assistant purchasing agent of the Goodyear Tire & Rubber Co., Akron, Ohio, has been elected secretary-treasurer of the Summit County Chapter of the Reserve Officers Association of the United States. Mr. Price holds a commission as First Lieutenant in the Quartermaster Reserve Corps, U. S. Army.

The West Boylston Manufacturing Co., manufacturers of tire fabrics, will move part of their plant from Easthampton, Massachusetts, to Alabama. The company employs 2,500 hands when running at capacity. Directors have decided that the condition of their company can be materially improved by purchasing stock of a company organized in Alabama, which purchase can be made for the consideration of 30,000 spindles with complementary equipment now at Easthampton of 137,504 spindles, and an additional cash consideration. The new company is to be located near Montgomery, Alabama. The plant at Easthampton will continue to be operated in development of fancies and specialties with the tire fabric division moved south.

E. Norman Bowry, purchasing agent of the Simplex Wire & Cable Co., Cambridge, Massachusetts, was elected president of the New England Purchasing Agent's Association at the annual meeting of that society held May 10.

The carbon black situation relative to the Louisiana flood condition caused some concern among local rubber industries who are large users of this material, but aside from a cleaning out of local spot stocks to supply the Akron demands, no local hardship was felt.

The Archer Rubber Co., Milford, Massachusetts, specializing in the production of fine rubber fabrics, rubber clothing, hospital sheeting, etc., has been allowed the use of the trade-mark "Glazette" for its rainproof fabrics.

The Michelin Tire Co., Milltown, New Jersey, has arranged a lease agreement to have a building erected especially for its own use at the corner of Ipswich and Lansdowne streets, Boston, Massachusetts. The company's present branch offices are at 901 Boylston street, Boston.

The Clifton Manufacturing Co., 65 Brookside avenue, Boston, Massachusetts, announces the following changes in its executive personnel, effective May 1, 1927: N. Lincoln Greene is now vice president and general manager; Donald B. Webster, treasurer; C. E. Buffum, assistant treasurer; and L. A. Beecher, assistant manager. The company's products include rubber clothing, shoe cloth, friction tape, splicing compounds, etc.

Maurice Ashley has been appointed sales representative for the New England territory of The Columbus Tire & Rubber Co., Columbus, Ohio, with headquarters in Boston, Massachusetts.

The Ross Wire Co., 69 Bath street, Providence, Rhode Island, formerly specializing in the production of bare and fabric covered wires and cords, has added a line of rubber covered cords for the electrical and radio trades.

L. Albert & Son, Inc., Trenton, New Jersey, dealers in rubber machinery, announce that Frank B. Batchelder, formerly connected with the Fisk and Murray organizations, is now representing the Albert concern in New England, with headquarters at Room 340, 80 Federal street, Boston, Massachusetts.

U. S. R. Promotions

Several promotions in the footwear division of the United States Rubber Co. are of interest. Henry S. Marlor, factory manager of the Alice mill in Woonsocket, Rhode Island, and the Millville, Massachusetts, plant of the Woonsocket Rubber Co., has been promoted to the position of supervisor of the footwear division of the United States Rubber Co., and in this capacity he will have authority over all plants of the footwear division with offices in New Haven and New York City. J. D. Wilmot, factory manager of the Boston Rubber Shoe Co., Malden, Massachusetts, Plant 1, and Plant 2 at Melrose, Massachusetts, has been promoted to be manager of the Woonsocket and Millville plants in place of Mr. Marlor. J. D. Wilmot has been at the Boston Rubber Shoe Co., since the death of the late P. C. Benjamin, several years ago, and previous to that was with the Goodyear India Rubber Glove Co., Naugatuck, Connecticut, another United States subsidiary. Leonard H. Goodue, teechnical superintendent of the Boston Rubber Shoe Co., has been made factory manager of both plants in place of Mr. Wilmot.

WATERPROOF SACKS

Containers for granular, dusty and brittle materials, such as potash, cement, salt, etc., are made of rubber and manufactured by Felton and Guilleaume Carlswerk A.-G., Köln-Mulheim. The sack is surrounded by a strong net with an opening at the top, about which is a metal ring.

Ohio

Operations of most of Ohio's rubber factories were maintained close to capacity levels during May. There was a substantial increase noted in the demand for tires from the automobile manufacturers. Shipments of tires to dealers continue heavy, although not quite up to the record breaking figures of March and April. The movement of tires through retail trade channels has been handicapped somewhat in parts of the country by the recent rains and cold weather.

A recession in the tire industry has been expected in some quarters, in view of the rapid pace maintained during the first quarter of the year, but so far there have been no signs of much curtailment. Schedules to be followed by the major plants early in June call for continued heavy production.

Output of golf balls and rubber hose, products always in greater demand in the spring, is considerably larger than last year. Tennis shoes are being sold in large quantities. Production of rubber footwear is again being increased to fill orders for fall delivery.

Foremost among the rubber companies which have registered substantial sales and production increases in 1927 are Goodrich, Goodyear, Firestone, Seiberling and General.

As a result of the greatest sales in the history of the company since the first of the year, Goodrich is manufacturing an average of 35,000 tires a day in the Akron plant. Goodrich engineers recently improved the Silvertown tire by developing a process for curing the casings by means of both hot water and steam.

Current production of tires at the Goodyear Akron plant is close to 50,000 a day. That company officials expect to maintain capacity operating schedules for some time is indicated by the fact that vacations for employes have been postponed until later in the summer.

The Firestone and Seiberling companies plan to increase their production next month, when plant additions will be put into operation. Firestone is turning out approximately 45,000 tires a day, and Seiberling around 8,000.

The consensus of opinion among rubber buyers in Akron is that higher prices for crude rubber will be seen before the end of the year. A runaway market is not looked for, but these authorities say a price of 50 cents a pound for rubber would be a conservative estimate in view of the 60 per cent restrictions and the larger consumption this year, both in this country and abroad.

The Kocker Tire Co., 5 West McMiken street, Cincinnati, Ohio, has just been appointed distributer for the Falls Rubber Co., Akron, Ohio.

H. D. Andress, president, Cleveland Equipment & Engineering Co., Swetland building, Cleveland, Ohio, announces a change of address after June 1, to 6306-10 Kinsman avenue. In the new location there will be 10,000 feet of warehouse space in addition to the main office. A railroad siding supplies excellent shipping facilities.

Goodyear Suit Settled

An amicable settlement between warring factions in the Goodyear Tire & Rubber control litigation, which has been in progress for nearly a year, was reached May 15. While exact terms of the peace agreement were not made public, the outstanding effect is that control of the world's largest rubber company again passes into the hands of the common stockholders. It really ends a six year fight to wrest the company from the hands of bankers who have dominated it since the post-war slump, when financial reorganization was necessary.

The principal changes in the financial structure of the company were the issuing of a $60,000,000 bond issue, bearing 5 per cent interest, retiring all 8 per cent securities, and the dissolution of all voting trusts. Accrued dividends amounting to $25 a share on the 7 per cent preferred stock will be paid off in new stock.

With elimination of the management stock, Dillon, Read & Co. no longer control Goodyear, although they are represented on the board of directors. President P. W. Litchfield, with his corps of assistants, continues in charge of operations. The following comprise the new board of directors: President P. W. Litchfield, Grayson M. P. Murphy, Robert C. Schaffner, Henry B. Manton, Russell L. Robinson, Frances Seiberling, G. A. Tomlinson, Clarence Dillon, John Sherwin, Elton Hoyt, II, E. B. Green, J. Arthur House, Walter B. Mahoney, Samuel Lewis Smith, Fayette Brown, Dr. Robert H. Bishop, Jr., Cleveland, and George B. Durnell.

The personal suits pending against Frank A. Seiberling, founder and former president of the Goodyear Tire & Rubber Co., will be settled in the near future, it is understood, following a friendly settlement of the Goodyear control litigation, in which Mr. Seiberling was involved. In his answer, Mr. Seiberling stated that the $3,744,729 charged against him on open account prior to October 31, 1919, was fully paid December 6, 1920, in real estate and corporate stocks. He asserted that while he was president of the company he permitted Goodyear to use his patents without paying royalty. A reasonable value of the use of these inventions was in excess of $6,000,000, Mr. Seiberling declared in his answer.

Frank A. Seiberling, president of the Seiberling Rubber Co., Akron, Ohio, reports net sales for the first four months of 1927, $4,368,000, compared with $3,719,000 last year. With prices 30 per cent lower than last year, the net dollar sales showed an increase of 19 per cent. Seiberling estimated there would be a general 10 per cent increase in the industry this year over last and that balloon tires will exceed 60 per cent of the total production of all countries. He predicted no price change.

D. C. Smith, associated with the Philadelphia branch of the Mason Tire & Rubber Co., Akron, Ohio, for a number of years, has resigned to engage in a business enterprise in Ohio.

E. R. Jobson, export department, Firestone Tire & Rubber Co., has left Akron for Valparaiso, Chile, to supervise Firestone sales in Chile, Peru and Bolivia.

H. C. Kirk, formerly connected with Firestone, is now with the Seiberling Rubber Co., Akron, Ohio, as Seiberling representative in the Louisville, Kentucky, territory.

G. M. Collette, formerly general manager of the Lambert Tire & Rubber Co., Akron, has moved to Dayton, Ohio, to engage in another line of business.

David L. Brown, of the Goodyear Tire & Rubber Co., sailed last month for Europe, where he will make an intensive study of foreign markets for rubber products.

Marion Adolphus Cheek, Jr., of Berkeley, California, captain of the 1925 Harvard football team and active in social service work at the Phillips Brooks House of Harvard, has been appointed graduate secretary of the Phillips Brooks House Association. He is the oldest son of A. M. Cheek, rubber planting expert associated with the Firestone Tire & Rubber Co., Akron, Ohio.

The R. R. Olin Laboratories, carrying on the work of consulting rubber technologists, have changed their mailing address from 852 Wall street, Akron, Ohio, to P. O. Box 72, Akron, Ohio.

The Falls Rubber Co., Akron, Ohio, reports new sales representatives for its West Virginia, Iowa, Western Pennsylvania and Kentucky divisions. The company manufactures Falls tires, Evergreen inner tubes, and Neverpinch rubber flaps.

The Rubber Plug Co., 2482 East 22nd street, Cleveland, Ohio, specializing in the manufacture of Crost tire repair material, reports a revision of its prices and a good volume of business.

The Wadsworth Rubber Manufacturing Co., Wadsworth, Ohio, is producing a line of automobile tires, as well as tire repair material, the latter class of goods being manufactured under the trade name of "Waruco."

Modify Restriction

E. G. Holt, chief of the Rubber Division of the Department of Commerce, predicted in a talk May 18 before the Kiwanis and American Business clubs in Akron, Ohio, that British crude rubber restriction will be modified or abolished entirely before the end of the year. The present scheme of restriction is not meeting with the satisfaction of rubber producers, he asserted.

Because of the independent growing of rubber, free from British trade dominion, and the wholesale reclaiming program under way in this country, the anticipated shortage of crude rubber has been postponed, if not averted altogether, Mr. Holt stated.

"America, in effect, produced 50,000 tons of rubber last year," he said, "for the reclaimers, operating at capacity, and bettering their product, made 100,000 more tons of reclaim than ever before. That is the equivalent of 50,000 tons of plantation rubber. At the same time production of wild rubber increased about 100,000 tons, so that a total of 150,000 tons was added to the world's rubber production."

The Lambert Tire & Rubber Co. has been taken over by a syndicate headed by George Seiberling, J. P. Seiberling and J. W. Coyle. They have formed an Ohio corporation under the same name to operate the company's plant in Akron. George Seiberling is the new president and general manager. He was formerly general factory manager of all the tire companies controlled by the United States Rubber Co., and from 1903 to 1920 was connected with Morgan & Wright in Detroit, Michigan. J. P. Seiberling is a son of Frank A. Seiberling, a leader in the rubber industry for years. Lambert first engaged in the manufacture of cushion and so-called puncture proof tires, and more recently entered the pneumatic tire field.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, shows an increase of 275 per cent in its tire shipments for the first quarter of the present year, as compared with the corresponding three months of 1926. Inner tube shipments for the period represent an even greater gain, or 309 per cent. John A. MacMillan is president and general manager.

The C. J. Tagliabue Manufacturing Co., 18-88 Thirty-third street, Brooklyn, New York, specializing in the production of industrial instruments, has opened a branch factory at 5902 Carnegie avenue, Cleveland, Ohio. The new division is in charge of A. R. Anderson, district manager. Messrs. F. A. Denz, F. L. Frock, and F. Cramer have also been assigned to special work at the Cleveland plant.

W. O. Rutherford, vice president of The B. F. Goodrich Co., addressing visitors in Akron from South and Central America and Mexico, at a banquet in the Portage Country Club May 19, stressed the advantages of closer friendships, better understanding and extension of trade relations between the United States and the Latin American countries.

"Akron, rubber manufacturing center of the world, owes its inception to a product of South America," he said. "The first rubber factory here was started in 1870, and from that time until 1905 our raw material came largely from South America. In 1900 the world production of rubber was 54,000 tons. Last year it was 614,000 tons." The visit of the delegation was sponsored by the Pan-American Confederation for Highway Education. The delegation toured Akron and Portage lakes and inspected the Goodrich, Goodyear, Firestone, Miller and General tire plants.

Balloon Tire Suit

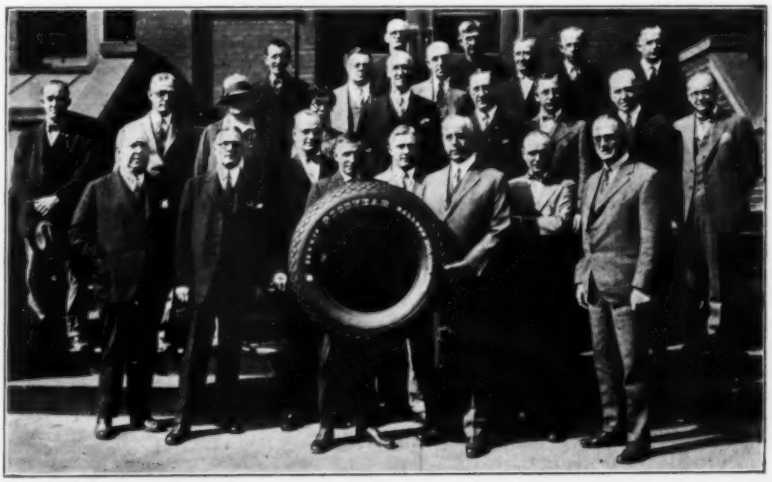
Suit has been started in the United States District court in Detroit, to test the validity of Alden L. Putnam's patent No. 1,537,879, issued May 12, 1925, covering the principle of construction involved in the manufacture of balloon cord casings. Although The B. F. Goodrich Co. is named defendant, the issue involved affects practically the whole tire industry. The Steel Wheel Corp., Lansing, Michigan, exclusive licensee under the Putnam balloon tire patent, started the action. More than 56,000,000 balloon tires have been manufactured in the United States since 1920, it is estimated.

It is claimed in the bill of complaint that Putnam became "the original inventor of a certain new and useful improvement in pneumatic treaded vehicle wheels not known or used by others in this country before his invention or discovery thereof, and not patented or described in any printed publication in this or any country before his invention thereof."

One Hundred Million Goodyear Tires

During the first week in May the Goodyear Tire & Rubber Co., Akron, Ohio, produced its one-hundred-millionth pneumatic tire, the total output to date being by far the largest of any tire manufacturing organization, according to Paul W. Litchfield, the Goodyear president. In 1912 the Akron company completed its first million tires, while early in 1923 the fifty-million mark was passed.

In addition to the Akron factories, two plants are maintained in Canada and California, with another under construction in Australia; five textile mills, a cotton plantation, a coal mine, and a rubber plantation in the Far East help to make possible a daily output of 65,000 pneumatic tires and 75,000 inner tubes. Over three million solid and cushion tires produced by the Goodyear organization are not included in the one hundred million total above mentioned. For this production of tires about 100,000 bales of cotton a year are necessary while the company is said to use nearly one seventh of all the crude rubber produced annually, or about 50 per cent more than any other manufacturer.



WILLIAM HIPPENSTEAL, OLDEST GOODYEAR EMPLOYE PRESENTS THE ONE HUNDRED MILLIONTH PNEUMATIC TIRE TO PRESIDENT LITCHFIELD. THE GOODYEAR OFFICIALS IN THE FRONT ROW ARE: W. C. STATE; C. A. STILLMAN; C. F. STONE; C. O. SLUSSER; P. W. LITCHFIELD; L. C. ROCKHILL, AND WILLIAM STEPHENS

Glenn H. Seely, Ohio representative of the Utility Manufacturing Co., Cudahy, Wisconsin, will sever this connection June 1, and devote his entire time to the management of the Thermo Instrument Co., Akron, Ohio, of which he is president.

Columbus Tire & Rubber Co., Columbus, Ohio, announces the appointment of J. H. Clements to cover the Detroit territory. Mr. Clements has had a number of years experience with Goodyear.

H. R. Baker, advertising manager of the Miller Rubber Co., Akron, Ohio, has been elected to serve as the first president of the new Akron Advertising Club. The charter membership in the club, which was formed May 4, embraces practically all the tire and rubber manufacturing companies in the Akron district. Many millions of dollars worth of national and international advertising emanates from this city annually.

The E-Z Cred-I-Tire Co., has recently established its third tire store at 37 South Fountain avenue, Springfield, Ohio, the others being in Dayton and Columbus, Ohio. The organization handles Hood tires exclusively in all three of its divisions.

Midwest

The Utility Manufacturing Co., Cudahy, Wisconsin, has completed arrangements to handle golf ball making equipment. A feature of the new line is a core winder designed by the Hohwieler Machine & Engineering Co., Morrisville, Pennsylvania.

The Lake Shore Tire & Rubber Co., Des Moines, Iowa, is almost ready to begin operations in the plant formerly owned by the Iowa Cord Tire Co., of Des Moines. The factory was purchased April 8 by Chicago and Omaha interests.

The La Crosse Rubber Mills Co., La Crosse, Wisconsin, has begun the construction of a plant addition, which when completed will provide 85,000 more square feet of floor space, or a total floor space of 435,000 square feet. Since the establishment of the company on a small scale in 1897, several plant enlargements have been necessary. The company specializes in the manufacture of rubber footwear, and is headed by the following executives: Albert P. Funk, president; William F. Funk, vice president; Arthur S. Funk, secretary and general manager in charge of production; and H. J. Putnam, general sales manager.

The Auburn Rubber Co., Auburn, Indiana, announces that Porter Pace has been placed in charge of the company's factory branch at 1118 Broadway, Fort Wayne, Indiana. The organization specializes in the manufacture of Auburn Red A tires.

The Gillette Rubber Co., Eau Claire, Wisconsin, is adding another story to its warehouse building, the new construction measuring 100 by 135 feet. Frank C. Hermann is president.

The Miller Rubber Co., Akron, Ohio, moved its Detroit offices about June 1 to 2778 East Grand Boulevard, where the capacity is double that of the former location.

J. H. Clements has been appointed Michigan representative of The Columbus Tire & Rubber Co., Columbus, Ohio.

The Cornell-Casper Tire Co., 1701 Baltimore avenue, Kansas City, Missouri, is handling the products of The Falls Rubber Co., Akron, Ohio.

The Corduroy Tire Co., Grand Rapids, Michigan, reports that R. R. Drake, for

R. R. Drake

eighteen years associated in an executive capacity with the United States Rubber Co., is now with the Corduroy organization as special representative in charge of dealers' accounts.

JAPAN'S FINANCIAL SITUATION

Japan's troubles are more political than economic, and although the present situation has its serious economic phases, the Japanese Government, whose credit is on a solid basis, has the ability to pilot its banking organization into safe waters. Japan's foreign trade continues to be handled by a strong group of banks, including the Yokohama Specie, the Sumitomo, the Mitsubishi, and the Mitsui, all of whom are fulfilling their obligations as in normal times and are buying commercial paper as usual. Some of the largest banks in New York City are also continuing to cover their forward exchanges with the above-mentioned banks, indicating that the position of the Japanese banking organizations is as strong as ever. The most serious phase of the Japanese situation is the temporary loss of thee country's trade with China, and no one can prophesy regarding the latter country's difficulties, although many believe that the crisis in China is passing.

Plant of The La Crosse Mills Co., La Crosse, Wisconsin

Pacific Coast

Ever Ready Rubber Products, which carries on the rubber business of the C. Benedict Manufacturing Co., Twelfth and Howard streets, San Francisco, California, according to President M. E. Dorman, has been doing a very big business in this country and abroad in sanitary skirts, patented garments which are designed to retain pleats in dresses. The company makes a complete line of goods from sheet rubber and rubberized fabrics, including dress shields, aprons, sheetings, shower curtains, infants' rubber wear, and various sanitary items as slips, skirts, and step-ins. H. M. Hyman is secretary of the new company.

The Thermoid Rubber Co., according to James A. Wheatley, Jr., Pacific Coast manager, has found far western business exceptionally good during the forepart of 1927, with brake lining leading, and orders well distributed for radiator hose, universal joint disks, clutch facings, belting, hose, packing, and tubing. All the Pacific Coast salesmen operate out of the San Francisco branch at 1263 Mission street, where a warehouse is maintained for the Trenton, New Jersey, factory.

The Pioneer Rubber Mills of San Francisco has been making improvements at its plant in Pittsburg, Contra Costa county, with a view of speeding up production. Business is reported as much ahead of a year ago. H. R. Mansfield, vice president in charge of production, left on May 10 for a six-weeks' business trip to include New York, Chicago, and other cities. G. B. Towne of the general sales department left on May 4 for a three months' sales trip to England and continental Europe. The Pioneer Mills has a well established business in Europe in garden hose, transmission belting, conveyer belting, piston rod packing, and other rubber goods.

The United States Rubber Co. reports that the money value of sales in the Pacific Coast territory is not only quite above that of the first third of 1926, but the total tonnage is considerably higher. According to General Manager J. B. Brady of the Pacific Coast Division at 300-336 Second street, San Francisco, sales for 1927 will break all records despite keen competition. He declares that between the Rockies and the Pacific Coast, agricultural conditions have not been as good in many years, and although some merchandising has been delayed by the late spring this will be well offset by lively business throughout the summer and fall.

Brown-Hunter, Inc., 700 Twelfth avenue, Seattle, Washington, is now in its new and well-equipped establishment, where a specialty is made of supplying motorists' needs. The organization, which is headed by two well-known Seattle men, handles McClaren Autocrat and All Road tires.

India Tire & Rubber Co., Akron, Ohio, has appointed A. D. Sprague, long in the service department at the factory in Akron, as service manager in the Pacific Coast territory. The company has been enjoying exceptionally good business since the first of the year, the increase in sales in the southwest section having been 150 per cent for the first quarter over the first three months of 1926. Pacific Coast Manager Frank L. Ryan, with headquarters at 455 Second street, San Francisco, has been preparing for big distribution during the remainder of the year.

The Michelin Tire Co., having discontinued its San Francisco branch, has appointed A. M. Scott & Co. of that city as its central California distributers.

Kelly-Springfield Activities

Kelly-Springfield Tire Co., New York, N. Y., is making a direct study of Coast trade conditions through Special Representative George M. Martin, of New York. Business has been exceptionally good so far this year, sales being more than twice as much in the first four months of 1927 as compared with the first third of last year, and prospects, company officials say, are most encouraging. The company maintains four factory branches on the Coast, as follows: Seattle, 1412 Ninth avenue, in charge of J. M. McDonald; Portland, 484 Gilsan street, C. W. Brown; San Francisco, 560 Ninth street, Pierce E. Meyers; and Los Angeles, 660 South Anderson street, J. P. Cahoon. Mr. Cahoon is very ill in a local hospital, but has been ably aided by J. A. Yale, who two weeks ago was appointed office manager at the Los Angeles branch.

Goodrich's Los Angeles Factory

The B. F. Goodrich Co., Akron, Ohio, has decided to build a factory in Los Angeles, which will be in operation within a year and involve an initial outlay of about $4,000,000. The mid-May announcement came as the sequel to many conferences between officials of the Los Angeles Chamber of Commerce and Bertram G. Work, president of the Goodrich company and chairman of the board of directors, C. B. Raymond, vice chairman, and L. D. Brown, vice president. The last mentioned executive

C. B. Raymond, B. G. Work, and L. D. Brown

had just finished a ten-days' personal survey of the location and of manufacturing and marketing conditions in the Pacific Coast territory. This had been preceded by an intimate study of the situation by Mr. Raymond, who lives at Montecito, adjoining Santa Barbara, California.

The plant will be erected on a 45-acre tract on Mines avenue in the eastern part of the city and in what is known as the Union Pacific industrial section. The first unit will cover between ten and fifteen acres, and furnish employment for from 1,000 to 1,500 persons with a payroll of between $1,500,000 and $2,000,000 a year. As now estimated, the initial output will be about 5,000 tires and 7,500 tubes a day. Later, factory additions will be provided for manufacturing other than automobile rubber products. Control of the plant will be in the hands of a western organization to be known as the Pacific-Goodrich Rubber Co., and it will be operated in much the same manner as the Goodrich factories in Canada, England, and France.

According to President Work, the company's decision to establish the southwest plant is the result of a very rapid growth in demand for its products, requiring not only a considerable increase in production but also better facilities for distributing its goods in the Pacific Coast states and also in the Pacific overseas markets," which are rapidly developing. Favorable factors influencing the decision were: The enormous number of motor vehicles in Southern California, Los Angeles county having 646,907 pasenger cars or 40 per cent of the entire state registration, and Southern California 909,809 or 56 per cent; climate advantages permitting year-round production, a free labor market, exceptional railroad shipping facilities, and nearness to the port affording the closest connections with the raw rubber producing zone in the Far East.

S. B. Robertson, director of engineering of The B. F. Goodrich Rubber Co., and who has been spending several weeks in Los Angeles assembling data for plans for the projected Goodrich factory in that city, has returned to Akron, Ohio.

Goodyear Tire & Rubber Co. of California was producing in the first half of May at its Los Angeles plant an average of 8,800 casings and 8,500 tubes daily, with a prospect of peak output within a fortnight. Every department is working close to capacity, and a considerable quantity of goods is being stored in the new warehouse and production building. When the parent Goodyear plant in Akron recently made its 100,000,000th tire, the Canadian plant was authorized to produce a tire with the serial number of 100,000,001 and the California plant No. 100,000,002. Vice president H. E. Blythe of the latter concern has returned from a conference with the Goodyear executives in Akron.

Samson Tire & Rubber Co., Los Angeles, California, reports that its factory at Compton, a suburb, is working three shifts a day, with no let-up in sight. Not only has there been a decided increase in unit output for the first third of the year over the corresponding period in 1926, but also in the money total of sales. President Adolf Schleicher is much gratified with the steady growth of tire sales in the company's new field on the Atlantic Coast.

The Hamilton Rubber Co., Trenton, New Jersey, according to General Sales Manager Frank C. Braden, who has been studying trade conditions on the Coast lately, has sold almost $1,000,000 worth of tires in the Pacific Southwest territory during the past year. The company is represented in this section by H. T. Myers, of Los Angeles.

Cactus Manufacturing Co., 914 East 59th street, Los Angeles, California, specializing on needle-studded tire boots and patches, has been enjoying a remarkably good business not only in the Pacific territory but throughout the entire country, according to General Manager C. J. Evans.

Gates Rubber Co., Denver, Colorado, which has been using 6.66 per cent of the city's light and power, will soon have its own electric plant. A building is being erected in which will be installed turbine generators capable of furnishing not only enough current for the present buildings, but also for a considerable addition.

Alvin N. Day of the Goodyear plant in Los Angeles gave a talk on tire building and materials at a supper of the Southern California Section, Society of Automotive Engineers, at the City Club, Los Angeles, on May 13.

Spreckels "Savage" Tire Co., San Diego, California, which has been in liquidation for several months to settle the estate of the late John D. Spreckels, has finally disposed of its large accumulation of casings, the last lot having been taken by the Wheeler Rubber Co., dealers, 406 West Pico street, Los Angeles, making the total value of the tires taken over by that firm from the San Diego factory fully $175,000. The factory and machinery have not yet been disposed of, but a deal is said to be pending for the sale of the equipment.

The Coast Tire & Rubber Co., Oakland, California, is forging ahead at a very rapid rate, according to J. C. Hughes, president, and Louis S. Budo, vice president and general manager.

Although the plant is not working at capacity, the output is being distributed through factory branches in Oakland, San Francisco, Fresno and Los Angeles, where the tires are being sold direct to the consumer.

Canada

It looks very much today as though women's gaiters were done — that women's overshoes have killed them. The large sale of women's overshoes was the outstanding event in the trade during the past winter season. One representative retailer reports that his sales were a third larger than in the previous season.

The expectation of a big sale of golf and tennis shoes during the present season is based on the fact that every year more people are playing golf and tennis, and with improving business conditions there should be more money spent on such purchases. The crepe sole for sport shoes is not in quite the same vogue as it was a year or two ago in certain sections of the Dominion.

Sales of lawn and garden hose are fairly good but what is required is warmer and more seasonable weather conditions. While it is impossible to predict the weather, there is every prospect of better sales of hose and dealers are well prepared with good-sized stocks.

W. H. Miner, vice president of the Miner Rubber Co., Ltd., Montreal, and exchairman of the Province of Quebec Division of the Canadian Manufacturers' Association, will attend the annual meeting of the Association to be held in June at Calgary, Alberta.

Seiberling Rubber Co., of Canada, Ltd., Toronto, announces that two carloads of special machinery for the manufacture of Seiberling tires have been brought to the Canadian plant. The company has in view a much larger production of the former K. & S. lines, in addition to the complete line of Seiberling motor car tires and heavy duty tires for trucks and buses. Executives are: Clifford A. Jones, vice president and managing director; R. J. Thomas, secretary-treasurer; Dr. W. W. Sanders, factory manager; W. J. Daly, general sales manager. The plant has a capacity of 1,000 tires a day and it is planned to double production immediately.

Dominion Rubber Company, Ltd., Montreal, is running a special series of advertisements that deal particularly with the prestige which comes from equipping a car with Dominion Royal Cord Balloons. The series is a most striking and interesting one, and is seen in all the leading dailies throughout Canada.

N. M. Lynn, sales manager of Ames Holden McCready Rubber Co., Ltd., Montreal, recently returned from an extensive trip through Western Canada to British Columbia, where he found business very good.

Northern Rubber Co., Ltd., Guelph, Ontario, has recently mailed the trade a handsome three-color folder, emphasizing the important feature of the Court Special shoe.

Provincial Sales Co., exclusive distributer in Montreal for Pennsylvania Rubber Co. of America, Inc., Jeannette, Pennsylvania, has removed to larger quarters at Beaver Hall Hill.

The Canada Golf Ball Co., Ltd., Toronto, appeared before the Tariff Advisory Board recently and presented an application for increased tariffs on golf balls, golf ball cores, and golf ball covers. The higher duties asked on golf balls entering Canada are: British Preferred, 25 per cent; Intermediate, 32½ per cent; General, 35 per cent.

British Tire Import Duty

Canadian Tire Manufacturers are considerably perturbed at the tariff placed upon tires entering Great Britain. Although there is a preference given to the British Dominions, it is insufficient to enable Canadian manufacturers to compete with firms established in England. R. C. Berkinshaw, secretary of the Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, expressed the belief that the import duty would keep Canadian-made tires out of Great Britain, and the only way to overcome the difficulty would be to establish a tire plant in Great Britain.

General Engineer U. S. Rubber Co.

The United States Rubber Co. made an important addition to its executive personnel when it appointed Henry R. Gilson to the position of technical assistant to the president of the organization as well as general engineer of the general division of the company.

A descendant of an old New England family, Mr. Gilson was born on a farm near Groton, Massachusetts, and received his earliest education in the schools of that town. After being graduated from the Groton High School, he worked his way through the Massachusetts Institute of Technology, taking an S. B. degree in mechanical engineering. After leaving college, Mr. Gilson was for two years in the engineering department of the United Shoe Machinery Co., at Boston. For the six years following he was assistant chief engineer of the Submarine Signal Co., also of Boston, while during the next six years he was in Pittsburgh as chief engineer of the National Metal Molding Co. For two years during the war he was assistant to the president of the Ross Rifle Company of Quebec.

Mr. Gilson's association with the rubber

Henry R. Gilson

industry began in June, 1917, when he became connected with the United States Rubber Co. as a member of the engineering section of the development department. In 1923 he was transferred to the president's staff while in 1925 he also took over the duties of general engineer of the organization, his work including an oversight of all the factories of the United States Rubber system, including such matters as plant operation, extension, etc.

Mr. Gilson, however, is by no means a "one idea" man, but finds time also for various activities outside the four walls of his office. Interested in out-door sports, he is a member of the New York Athletic Club, while he spends his vacations going into the woods on camping trips, accompanied by his young sons. He is the father of six children, five of whom are living. A deeply religious man, Mr. Gilson carries forward the work of treasurer of the First Methodist Episcopal Church of New Rochelle, while he considers his raising a fund for that organization of $125,000 in one year as one of his life's biggest achievements.

Possessed of an attractive and interesting personality, Mr. Gilson is welcomed as a lecturer on technical subjects and those pertaining to the rubber industry, while he has also contributed many articles to technical publications.

AMERICAN AUTOMOBILE INDUSTRY AND TIRE PRODUCTION—1926

The 1927 edition of *Facts and Figures of the Automobile Industry* as prepared by the National Automobile Chamber of Commerce shows by means of useful compilations that combined production by the United States and Canada of automobiles and motor trucks is continuing its steady increase. The output of automobiles has risen from 3,243,285 in 1924 to 3,839,302 in 1925, while the record for 1926 is 3,936,933. Corresponding totals for motor trucks include 363,530 vehicles in 1924, 473,154 in 1925, and 491,353 in 1926. The wholesale value of these cars and trucks reached in 1925 $2,523,642,558 and $454,262,275 respectively, the 1926 figures being $2,730,385,507 and $433,371,169. For 1925 the value of replacement parts and tires was $923,440,000, the 1926 total reaching $1,224,937,000.

There were 3,743,000 persons employed in the automobile industry during 1926, of this number 100,000 being tire factory workers and 95,000 tire dealers and salesmen. Out of a total consumption in the United States of 358,461 tons of crude rubber, 303,616 tons, or 84.7 per cent, was utilized in the manufacture of motor cars and trucks, while the figures for automotive freight included 55,000 carloads of tires and 15,600 carloads of crude rubber. There were 22,000,000 motor vehicles registered in the United States in 1926, 19,237,000 being motor cars and 2,764,000 representing commercial vehicles. The Motor and Accessory Manufacturers' Association reports a value in 1926 of units, parts, tires, etc., for original equipment as totaling $823,394,000, while the value for units, parts, accessories, service equipment and tires for replacement and additional equipment is given as $1,224,937,000. Estimates as of January 1, 1927, show 80,000 motor buses in operation in the United States.

The following tabulation has been supplied by the Rubber Association of America:

	Production		Shipments	
	1925	1926	1925	1926
High pressure casings	40,087,529	32,372,949	39,863,384	31,835,553
Balloon casings	20,756,858	29,099,318	19,504,182	27,167,790
Solid and cushion	1,011,866	749,388	1,067,193	723,716
Inner tubes	82,614,034	76,618,409	80,992,012	71,592,081

EXPORTS OF AMERICAN RUBBER GOODS

Exports of rubber manufactures from the United States during the calendar year of 1926 totaled in value $60,051,332, or a gain, according to the Department of Commerce, of $7,421,410 as compared with the previous year. From the tabulation below it will be noted that from 1924 through 1926, each successive year has represented an advance in value for each of the four main classes of rubber manufactures.

RUBBER GOODS EXPORTS

	1924		1925		1926	
	Value	Per Cent	Value	Per Cent	Value	Per Cent
Automotive rubber	$20,822,186	51.2	$29,002,167	55.1	$33,173,896	55.2
Footwear	6,752,211	16.2	7,426,403	14.1	9,155,606	15.3
Mechanicals	4,656,221	12.5	5,403,318	10.3	6,629,283	11.0
Other rubber manufactures	8,390,977	20.1	10,798,034	20.5	11,092,547	18.5
Total	$40,621,595	100.0	$52,629,922	100.0	$60,051,332	100.0

Automotive rubber goods continue to represent by far the leading class of exports, but while values of shipments increased during 1926 the volume has in general declined. Argentina, instead of the United Kingdom, became the leading market, the two countries exchanging places, while Cuba ranked as third followed by Germany, the latter country being a newcomer among the important tire markets. Mexico, Japan, and Brazil were other noteworthy customers, the seven countries mentioned taking over 50 per cent by volume of automotive rubber goods, but only 46 per cent by value. The principal markets during 1926 for tire repair materials were Australia, Argentina, Canada and the United Kingdom, each of these countries taking over $100,000 worth of this class of goods, Australia's share being over $200,000.

Rubber footwear figures during 1926 exceeded those of 1925 in both volume and value, the value being 23 per cent greater. The general tendency was toward larger shipments during the last half of the year, with peaks in September and December. Mechanical rubber goods gained slightly in volume during 1926, while unit values were also higher. There were declines however in shipments of hard rubber goods and also in various rubber specialties, while a fluctuating trend was evident in the shipments of both scrap and reclaimed rubber.

Truck Tire Economics

Effects of Solids, Cushions, and Pneumatics on Roads and Vehicles—How Worn Tires Do Double Damage

THE importance of highway officials requiring and motor truck owners adopting reasonably good tire equipment with moderately loaded vehicles is strongly emphasized in a review of service and laboratory studies of solid, cushion, and pneumatic tires, entitled, "The Motor Truck Tire in Its Relations to the Vehicle and the Road," read by James A. Buchanan, assistant testing engineer United States Bureau of Public Roads, at a transportation meeting of the Society of Automotive Engineers in Boston, Massachusetts. The data were compiled from reports of research conducted by the Bureau of Public Roads, the Iowa State College, and the Johns Hopkins University, reviewing material also supplied by the S. A. E. and the Rubber Association of America.

Impact Test Showings

For impact tests a special apparatus noted in pounds the total vertical reaction between the road surface and the truck wheel. It showed the percentage of the static wheel load for each of the test conditions used with truck sizes ranging from 1 to 5 tons and having various combinations of type and size of tires. Vehicles were operated at four loads, varying from an empty truck to one and one-half times the tire-carrying capacity, and speeds ranged from 3 m.p.h. to about 20 m.p.h.

Pneumatic tires, it was noted, did not permit an impact force greater than twice the static load, at least up to two inches in the height of an inclined plane. With worn out solid tires, yet with the same truck, load, and speed and impact reaction of twice the static load was developed in passing over an inclined plane only .15 inch in height, while at two inches the reaction was nine times the load. When new the same solid tires caused but half the reaction of the worn ones. The pneumatics carrying 4,000 pounds per wheel did not cause reactions as great as 4 tons when running between 15 and 20 miles an hour, but the worn-out solids, carrying only 3,400 pounds each, caused reactions of nearly 20 tons.

Harm Done to Vehicles

Excessive loads tended to lessen the differences between the relative cushioning qualities of tires so that impact effects became nearly alike. Dual mounting caused heavier impact reactions than single, inasmuch as the single tire offers a relatively thicker and narrower cushioning medium than the dual. In comparing overloaded and oversized tire equipment, it was noted that the impact force was only 15 per cent in excess of the static load for the rated size of underinflated tires, but nearly 700 per cent for the oversized worn out solids with the same truck having the same loads.

At speeds up to 5 m.p.h. the impact force of solids increased while that of pneumatics remained about constant; and between 5 and 15 m.p.h. the force for solids rose until it was about three times that of pneumatics. With pneumatics it was found hard to get road reactions of double the static wheel load, but with worn out solids such reaction can easily rise above ten times that amount. Thus a careless operator of a 3-ton truck with worn solids may experience a long succession of trip-hammer-like blows equivalent to even 35 tons against his tires to the great detriment of his truck, the load, and the road.

Pavement Damage and Gasoline Consumption

As to the comparative impact effects of 6-wheel and 4-wheel vehicles, it was found that the unsprung component in the case of the 6-wheel was but half the reaction of the 4-wheel truck, or, in other words, produced but half as much tensile deformation in a 6-inch concrete pavement. A solid tire worn 50 per cent showed in service and laboratory tests fully 250 per cent as much impact on pavement as a new tire. Another point brought out was the importance of using tire equipment in which all tires are the same circumferentially in cross-section. A worn one or one with tread depressions quite unlike its team-mates may cause an unbalance very harmful to car and road.

Other interesting points elicited were that resistance of solids is more than 50 per cent greater than pneumatics, and the resistance of a rough pavement is from 1/3 to 1/6 greater than for a smooth pavement. Resistance on hard, natural soils is more than 1/16 of the load carried. Gasoline consumption is no more for a load on pneumatics at 25 m.p.h. than for the same load on solids at but 10 m.p.h.

FRONT ROW LEFT TO RIGHT: IRA S. GALKIN, JAMES J. McDERMOTT, JACOB KENNER, HON. JAMES J. DAVIS, JOHN J. BROCHU, B. KENNER, AND H. KENNER.

The American Insulated Wire Corporation, Providence, Rhode Island, was recently honored by a visit from the Hon. James J. Davis, Secretary of Labor, during his last trip to Providence. The Secretary was shown through the plant, and expressed his interest in the manufacture of rubber-covered cables and cords. He is seen in the accompanying photograph with the executives of the company.

The Rubber Industry in Europe

Great Britain

With London stocks of rubber steadily increasing, there is said to be "a trace of lassitude" in the British market, particularly as it is thought that these surplus supplies may advance from the present figure of approximately 65,000 tons to 70,000 or 75,000 tons before a change for the better may be expected. This condition of affairs is, however, not preventing planters from making moderate additions to their acreages, the Dunlop organization in particular considering arangements to extend its planted areas by 11,500 acres at the earliest moment.

Meanwhile the reduction of the export quota from 70 per cent to 60 per cent is arousing many comments, certain exponents of the English rubber trade openly asking the repeal of the restriction measure and claiming that its final effect will be the alienation of important markets. *The Evening Standard* of London asserts that if the Stevenson Plan is continued, the Dutch planters will begin production at full capacity and will take more and more of the British share of world markets, while in addition, the United States will refuse to buy the usual quantity of crude rubber, and will turn more willingly than before to the use of reclaims. Other authorities believe that could a majority be secured of British rubber men opposing the restriction measure, the control of the rubber output would speedily be brought to an end.

New Bridge Street Paving

The demonstration made by The Universal Rubber Paviors (Manchester 1923) Ltd., Audenshaw, Manchester, was photographed after the rubber blocks had been under traffic for over six months. It is generally conceded that the heaviest and most intensive traffic of London passes over New Bridge street, which is a continuation of Blackfriars Bridge and ends in Ludgate Circus, linking the docks of the Thames with the great markets and heart of the city.

The illustration shows plainly how the work has been carried out round manholes and grids, two grids showing on the left of the picture, and one manhole roughly on the same level but in the center of the roadway, another manhole further away on the right hand side.

The condition of the paving is said to be perfect and London's chief engineer reports that, after examination, it has been found that the pavement has not moved or crept; the rubber blocks are standing up to traffic without breaking, with grooves and the small lettering which had been indented on some of the blocks as sharp as when first laid; no water is going through the joints; a few blocks, out of an area of 700 superficial yards, are fraying on the sharp edges where those edges are lying proud, but this fraying will probably wear smooth and round; there is an absence of vibration, noise and dust; the pavement is easily cleaned; no wear appears on the surface of the paving, and, so far as is known, there have been no accidents due to the rubber.

This successful demonstration opens up large possibilities for the future, the rubber paving, because of its incomparable qualities of resistance to wear, silence, absence of vibration and cleanliness, is unlike any other roadway and must eventually be installed on busy streets and selected areas.

The Tire Import Duty

The inclusion of motor tires among the list of articles subject to the McKenna duties has brought out some interesting statements from prominent rubber men. No one has been observing with greater satisfaction this granting of protection to British tires than Colonel J. Sealy Clarke, of George Spencer Moulton & Co. Colonel Clarke is one of the foremost in this long battle for the rights of the English manufacturer. He said recently:

We are delighted that the Chancellor has at last seen his way to assist our industry after our struggle of seven years' duration. It is a great thing to have got tires put upon the same footing as motor cars and every other accessory attaching to them. What the future has in store it is difficult to say, but we are confident that the production of home-made tires will be substantially increased; also that, as a result of that increase, we shall be able to manufacture at a lower average cost, and so have a reasonable chance of competing with the foreigner in our dominions and colonies. . . .

We do not contemplate with any feeling of dismay the setting up of factories in this country by alien firms, for the reason that they will be producing tires under conditions similar to those with which we have had to contend. All we ask is that the conditions shall be fair and equal. Another advantage of the establishment of new factories in this country will be the wider employment of British labor and the circulation of more money, which must necessarily be to the good, not only of our own trade, but of all others.

Alexander Johnston, managing director of the North British Rubber Co., said that, for reasons of policy connected with the World War, tires were specifically excluded when the original McKenna duties first came into force. When America joined the Allies the reasons for the exclusion of tires disappeared, and since then British manufacturers had not ceased their efforts to induce successive Chancellors to bring tires, as the most important accessory of cars, once more within the duties. Mr. Johnston thought that it was unlikely that tire prices will be lowered, and further stated that during the past six months prices had been reduced 50 per cent, being actually lower than before the war.

At the annual meeting of the Dunlop Rubber Co., Ltd., Sir Eric Geddes, chair-

Keystone View Co.

Rubber Paving Laid on New Bridge Street, London, by Universal Rubber Paviors, Ltd.

man of the organization, stated that there was no doubt that the immediate result of the imposing of the McKenna duties must be to increase the demand for British manufactured tires. He further said that his own company was at present operating at capacity, and an increased demand must involve extensions of capacity, but that would be justified financially only if a reasonable measure of permanency were presupposed. He dreaded the possibility of future Chancellors making their first act the ruthless abolition of the McKenna duties on tires.

Mr. Churchill, the present Chancellor of the Exchequer, claims that the extension of the McKenna duties to cover tires has been estimated to yield £700,000 this year, and £750,000 in a full year's time.

Sweden

At least 60 per cent of the rubber accessories for automobiles imported into Sweden during 1926 came from America. The balance is supplied by European makers, chiefly English and French. The types of tires used are both straight side and clincher casings, though the former appears to be gaining in popularity. Solid tire sales have dropped considerably during the last few years.

The figures covering American exports of tires to Sweden in 1926 show a decline both in volume and value, totals for 1926 having been 40,822, valued at $805,874 instead of 55,671, value $960,983, as far as casings were concerned, and 27,224, value $82,834, instead of 42,753, value $96,076, for automobile inner tubes.

Four important companies monopolize the Swedish rubber footwear industry, but in spite of this, America exported rubber footwear to Sweden valued at $164,089 in 1926, $131,084 in 1925 and $77,777 in 1924. The increase in shipments of rubber heels and soles ($65,000 in 1926 against about $6,000 in 1924) is chiefly responsible for the rise in exports of rubber footwear and accessories. On the other hand, exports of canvas rubber-soled shoes, never very high, have steadily declined. England also exports considerable quantities of rubber footwear to Sweden, the 1926 figures having been 11,462 dozen pairs, value £23,731 against 10,219 dozen pairs, value £20,275.

Besides the above, America sent to Sweden rubber hose to a value of $29,857 and $21,866 in 1926 and 1925 respectively, besides packing valued at $6,540 in 1926 against $5,353 in 1925, and belting valued at $50,486 in 1926 instead of $73,936.

American exports of rubber sundries and specialties in 1926 totaled $81,372, bathing caps alone accounting for $36,563.

In all, the American trade in rubber goods with Sweden came to $1,302,957 in 1926 as compared with $1,487,016 in 1925. As shown above, the decrease was mainly due to decreased tire and tube exports.

Germany

Reports from the Chambers of Commerce and Industry for the district Hannover where some of the biggest rubber works in Germany are operated, state that during March, 1927, a slight improvement in the German rubber industry was noted. Employment was satisfactory, most branches working to capacity and part time schedules being resorted to only in individual cases. But prices at which goods are sold continue low so that considerable difficulties are looked for.

In the wire and cable industry the situation remained unchanged. A feature of all business is the constant lowering of prices and underselling, which is regarded with a certain alarm in some quarters and finds expression in frequent more or less pessimistic outbursts in local trade papers.

The sudden and rather unexpected drop in the price of crude rubber in the early part of 1926 has not been without effect on the already hard-pressed German rubber industry, as a review of recently published business reports shows. Several firms have omitted the distribution of dividends and some show adverse balances at the end of the business year.

German Notes

Deutsche Kabelwerke A.-G., Berlin-Lichtinberg, reports that while the wire and cable departments show almost 50 per cent increase in the value of sales during 1926 as compared with 1925—and that at poor prices—the rubber departments suffered because of the fall both in the price of raw rubber and of the manufactured article. Thus neither of the two affiliated companies, Julius Friedländer Gummiwaren G. m. b. H., and the Deka-Pneumatik G. m. b. H., showed surpluses, the latter firm actually closed the year with a loss. The main concern booked net profits amounting to 381,524 marks and turned out dividends of 6 per cent for the past year.

Gebr. Korting A.-G., Hannover, reports improvement in the orders received, but closes the year without distributing dividends.

Asbest und Gummiwerke Alfred Calmon A.-G., Hamburg, is another firm that had to disappoint shareholders by withholding dividends. This concern had to draw upon the profits carried over from 1925 to the extent of 89,856.64 marks, to cover losses suffered on account of sudden drop in the prices of raw rubber and cotton.

Gummiwarenfabrik A. Benndorf & Co., G. m. b. H., Leipzig-Plagwitz. Bankruptcy proceedings have been started in connection with this firm's assets.

Continental Caoutchouc und Gutta Percha Compagnie, Hannover, issues a rather pessimistic report over the working of the past year. Losses suffered through the drop in prices of raw material, the necessity of buying reclaims from the outside because the firm's reclaiming plant was burned to the ground, low selling prices, severe competition in foreign countries and the failure to collect sums outstanding, all served to keep down profits so that in the end net profits amounted to only 353,888.28 marks, almost all of which was carried forward. So far 1927 shows an improvement over 1926—as sales are higher, but prices obtained continue to be low.

Peters Union A.-G., Frankfurt-am-Main, reports satisfactory business during 1926. Net profits for the year came to 798,040.18 marks, and with the addition of the 1925 carry forward were 1,025,527.15 marks.

Austria

The rubber industry was rather well represented at the Vienna Spring Fair recently held and business transactions proved satisfactory on the whole. There was a good demand for certain local rubber specialties particularly surgical goods and toys. A Dr. Leopold offered a new rubber roller particularly adapted for massaging arms and legs.

Much interest was aroused by a special exhibit of Polish goods including a fine collection of rubber articles from one rubber factory.

France

Société Industrielles de Telephone has decided to increase its capital from 36,000,000 francs to 54,000,000 francs by issuing 60,000 shares of 300 francs each with a premium of 60 francs each.

The Compagnie de Caoutchouc Manufacturé, Paris, originally was Maison Lejeune-Chapel et Cie, established in 1851. In 1885 it became Maison Bapst et Harnet and in 1901, it was acquired by Hirtz, Michel-Levy et Bloch and reorganized under its present title in 1914. The original factory, which has been extended several times and completely transformed, produces hard and soft rubber goods, especially for the automobile industry.

Manufacture de Caoutchouc de St. Ouen, formerly Blanchisserie de Thaon, goes back well over 75 years, as it was founded in 1845. Technical rubber articles are this firm's specialties.

Etablissements Maurel Frères & Cie, 140 Rue de Rivoli, was founded by M. Alphonse Maurel in 1853. Rubberized fabrics and articles thereof form the chief products.

The Rubber Industry in the Far East

Malaya

Restriction is in again for its periodical examination, and as usual the question is whether it should continue, and for how long, or whether it should shortly be set aside for good.

Ceylon has always grumbled over restriction, but Malaya has taken to it very nicely, in fact it is so popular in some quarters that it has been suggested—more than once—to keep it on the statute book permanently. However, even here there are quite a few people who regard it uneasily. After all, restriction was intended to be a temporary aid to the industry and not a permanent crutch. It will soon have passed its fourth year and how much longer will it yet be kept in force and most important of all what benefits may still be expected from it and what has it really accomplished so far.

Certain ungrateful souls point out that for one thing restriction helped the Dutch to increase their output from some 90,000 tons to over 200,000 tons per annum, that in fact the British were being slowly forced into the background by the Dutch. Which, as Mr. Still points out in the *Straits Times*, is absurd for did not the Dutch make most rapid progress in the ten years preceding restriction, chiefly by means of British and American capital. In fact, if the Dutch had been content to leave rubber growing to the British, there would have been no need for restriction. For what was the reason for restriction? Simply overproduction. Due largely to the incoming of the Dutch supplies (which, as we were told above were largely produced with British and American capital), the markets of the world were glutted with rubber.

However the gains accruing to Malaya due to restriction have been such that Mr. Still can overlook to a certain extent the sins of omission and commission perpetrated by the Dutch.

This is what he figures restriction has done for Malaya:

NET MALAYAN EARNINGS

1922	$141,770,000
1923	228,746,000
1924	189,782,000
1925	510,163,000
1926	491,361,000
Total	$1,561,822,000

The year 1922 is regarded as unrestricted, and without prohibition the best that could have been hoped for was that the next four years would average no worse than 1922. Therefore we find:

Five years (including 1922) with restriction	$1,561,822,000
Five years without restriction	708,850,000
Gain by restriction	$852,972,000

Of course if we are quite sure that, without restriction, prices would have remained at the level prevailing in 1922, why then the argument is irrefutable.

The Malayan Tin & Rubber Journal apparently represents the opposite view. Not that this paper has consistently been against restriction. On the contrary, it has always been in favor of it but not as a permanent institution. It frankly states that it considers the time very near when restriction should be dropped. Restriction cannot go on forever; it has served its purpose and should now be abandoned, and now is as good a time as any for rubber planters in Malaya today are in a very strong position and able successfully to wage competitive war with the Dutch. The longer the matter is delayed, the more severe will be the reaction when restriction is finally discarded.

The paper quoted urges that the government and the planters go into the matter and carefully consider how much longer it is wise to retain the Stevenson Restriction Scheme.

Malayan Notes

Rubber smugglers are more active than ever, it seems. The cut in permissible exports evidently is the cause for this. From March 23 to April 1 inclusive, seven captures were made on five different days. One native vessel on seeing the Customs launch threw the cargo of rubber overboard. The quantity of rubber found on the six other boats totaled over 180 piculs or some 24,000 pounds, that is roughly ten tons in a week.

The Caledonian (Selangor) Rubber Co., Ltd., proposes to form a subsidiary to develop the land recently acquired. This land has an area of 2,000 acres and is located in the Ulu Selangar district. The subsidiary company will be known as Ulu Caledonian, Ltd., and it is proposed to have a nominal capital of £100,000 divided into shares of £1 each. The development of the 2,000 acres is to be financed by an issue of debentures for £50,000 to be made by the subsidiary company and it will carry interest at the rate of 7 per cent per annum.

The Perak planters have been agitating for a definition of the system of restriction assessments and it seems they have now gone a step further and have passed a resolution that there will be no further interference with existing assessments except as far as young areas are concerned, on which an increase is automatically to be expected.

The Haytar Rubber Co., Ltd., reports profits of $111,934.71 for the past year. Dividends amounting to 50 per cent were distributed during the year. The average yield on this estate is 352.25 pounds per acre.

Tapah Rubber Estates, Ltd., had profits of $366,569 for the year and paid out dividends of 45 per cent. The crop obtained was 590,845 pounds, sold at an average of 2 shillings, 1¾ pence per pound. The high average was attained with the aid of a favorable forward contract. The financial position is strong, their being available over $240,000 of liquid assets. The company paid its first dividend in 1912 and altogether has paid 207½ per cent in dividends or an average of 15 per cent per annum.

During March, 1927, 239,813 gallons of latex were exported from Malaya and for the first three months of the year the amount was 524,738 gallons.

Native rubber entering Malaya in March, 1927, reached the record figure of 17,461.86 tons. Of this 14,815.02 tons consisted of wet rubber. The total native shipments for the first quarter of 1927 came to 44,153.25 against 33,343.98 tons during the same period of the preceding year. These native imports which mount so rapidly when prices go down and restriction is tightened will bear watching.

Ceylon

The Ceylon controller of rubber issues the following statement of exports of rubber from Ceylon:

	Exportable maximum Tons	Actual Exports: Ceylon grown rubber Tons	Actual Exports: Exports of imported rubber Tons
November, 1926...	4,923	4,228	321
December, 1926...	4,923	6,498	618
January, 1927...	4,923	6,753	404
February, 1927...	4,307	3,306	208
March, 1927...	4,307	7,111	642

The outstanding unused rubber coupons in Ceylon on March 31, 1927, represented a total of 10,415 tons.

Research Scheme

T. E. H. O'Brien, of the Research Scheme, Ceylon, contributes some notes on visits to some rubber factories and research laboratories in England. What he particularly stresses is that both in the factories and in research institutions, it was impressed on him that the chief defect of plantation rubber today is variability of plasticity.

Brown Bast

At a recent Agricultural Conference, J. Mitchell, organizing secretary, Rubber Research Scheme, Ceylon, read a paper on "Brown Bast and Its Treatment." He pointed out in the paper that during the period of restriction, tapping was stopped on portions of estates which showed signs of reduced yielding power, which had the effect of masking the seriousness of this disease as a factor in reducing yields in the restriction area. But in 1926, when 100 per cent production was permitted for the greater part of the year, there were indications that Brown Bast had again begun to assume more serious proportions and the writer was led to believe that when full production on estates is again resumed, the disease would become a factor of increasing importance in the rubber industry.

He then described the well-known symtoms and discussed various methods of treatment. He found that just resting the trees without giving any kind of treatment was useless as the disease extends during the resting period. The three methods of treatment practised are stripping, scraping, and isolation.

Netherlands East Indies

In a recent issue of the *Archief voor de Rubber Cultuur*, Dr. J. Schweizer in discussing superior planting material from Hevea in Besoeki, Java, presented several interesting observations which led him to stress the importance of seed from selected mother trees to be used as planting material.

It was found, namely, that trees from illegitimate seed (seed resulting from free, uncontrolled pollination) of selected mother trees, produced as much rubber per bouw (1.74 acres) as was obtained from the best clone in the experiment gardens of the East Coast of Sumatra Rubber Planters' Association. In addition, careful observation and experiments showed that the variations among descendants of a given mother tree were not as extreme as has hitherto been held to be the case, in other words, the productivity of a high yielding mother tree was fairly constantly reproduced in the trees grown from seed of such a mother tree. The two facts lead to the suggestion that the Heveas in the plantations are perhaps after all of purer strain than is generally supposed at least as far as productivity is concerned.

If this is granted there is still a chance that by cross breeding an improvement in existing material may result owing to polymerism. Thus if the maximum production of Heveas depends on eight factors it would be possible that one mother tree possessed six of these factors and the other only two; but if by crossing, the eight were brought together in one individual, the result would be a hybrid with the maximum production capacity, which would therefore be superior to both parent trees.

All this suggests that expectations from legitimate seed (of known origin) may be placed too high.

In connection with the foregoing it is pointed out that the number of clones (of bud grafts) approved does not even represent 10 per cent of those tested, which might be taken to indicate that only a small number of selected mother trees apparently have inherent powers of high productivity, that the high yields of most of these trees, therefore, were due to accidental, favorable circumstances.

But it is hard to believe this, and an explanation is offered in the possibility that clones may be approved or rejected too soon, for in Deli it has repeatedly been found that clones that at first did not rate very high, after a time proved to be superior to a clone previously acknowledged as having excellent qualities. There seems to be a certain stage of development in bud grafts that has still to be investigated.

Experiments in Besoeki

There is considerable demand for selected planting material in Besoeki, Java. The experiment station has 46 mother trees which have supplied budwood for thousands of trees planted under the most varying circumstances on various estates. In addition to these 46 trees, the experiment station has tested a number of mother trees on estates interested in the matter, so that there are now altogether 200 mother trees to draw on for bud grafts.

The method generally used is to plant bud grafts and selected seed from mother trees alternately. It is important to note that large areas are no longer planted with untested clones.

In Besoeki an up-to-date estate that takes up budding on a big scale has: (1) Nurseries, where stumps are raised for large plantings; (2) A large collection of its own mother trees besides those from other districts, all planted side by side in small areas to facilitate the early discovery of favorable or unfavorable characteristics to be utilized for future plantings; (3) Always a big supply of stems for stock from seed of selected trees, known to yield well and grow rapidly. In this way any influence that the stock may have on the budded tree is taken into account. All data concerning the way in which scion and stock unite are carefully recorded for future reference; (4) A wide choice of material for a budded area, only stumps with the healthiest and best developed shoots being planted. The rate of growth, which may be influenced by the value of the buds used, receives special attention.

Tests are being made in the experiment station with grafting buds from a certain tree on stock from the same tree; on stock from good and bad yielders; and on rapidly growing stems as well as those that grow slowly, all in an effort to solve the above problems. In addition tests are in progress to determine what influence the part of the tree from which a bud has been taken has on the quality of the bud graft, because it is probable that differences in the value of the bud wood are responsible for the variability of a clone as far as morphological and physiological properties are concerned.

As for seedlings, most of the estates have their own seed trees in gardens more or less carefully thinned out.

These trees are selected mother trees and their seeds are the result of free uncontrolled pollination, illegitimate, therefore. Trees from seed from the Kiara-Pajoeng mother trees have been found to inherit the productivity of the mother trees, with marked constancy and it is therefore planned to select very carefully, by a process of rigorous selective thinning, the best of these trees on two particular little areas for the purpose of producing seed which it is expected will rank with the best.

There are besides the above areas producing illegitimate seed, small plantings for legitimate seed, each planted with the seed from one clone and another planted with seed from two different clones.

N. E. I. Notes

The West Javasche Landbouw Mij., Middelburg, has sold forward out of crop 1927, 15,000 half kilos rubber at an average of 1.10 guilders per half kilo f. o. b. Amsterdam.

Rubber Mij. Tjibantjet, Middelburg, again sold forward out of crop 1927, 36,000 half kilos rubber, at an average of 1.10 guilders per half kilo (about 44 cents per 1.1 pounds) f. o. b. Amsterdam.

Cultuur Mij Salatri Plantations, Middelburg, again sold forward out of crop 1927, 72,000 half kilos, at an average of 1.10 guilders per ½-kilo, f.o.b. Amsterdam.

Zuid Preanges Rubber Mij again sold forward out of crop 1927, 92,000 half kilos, at an average of 1.09 guilders per half kilo, f. o. b. Amsterdam.

The N. V. Rubber Cultuur en Handelmaatschappij Djambi, of Amsterdam, has received permission to erect and operate six small factories to prepare native rubber. Five of these will have a capacity of up to 5,000 tons dry rubber.

Dr. O. de Vries, head of the Rubber Experiment Station, Buitenzorg, Java, is going to Europe on leave shortly. In his absence, Dr. T. A. Tengwall will take his place at the experiment station.

Rubber Patents, Trade Marks and Designs

United States

April 12, 1927*

1,623,993 Heat retaining garment. Arvid E. Anderson, assignor by mesne assignments, to Airubber Corporation, both in Chicago, Illinois.

1,624,102 Swimming wing. William Kennedy, assignor by direct and mesne assignments, to Airubber Corporation, both of Chicago, Illinois.

1,624,144 Sound receiving earpiece. Harry J. Mathieu, Oakland, California.

1,624,500 Composite rubber sole. Albert Linn Murray, Auburn, Indiana.

1,624,619 Tire patch. Lee R. Moore, Kansas City, Missouri.

1,624,688 Pneumatic wheel. Ferdinand K. Svenson, Detroit, Michigan.

1,624,807 Pneumatic pad for animals. Joseph A. Schinner, Greenfield, Ohio.

1,624,822 Cricket, hockey and like ball. George William Beldam, Ealing, England.

April 19, 1927*

1,624,914 Tire valve. David W. Beechtel, assignor of forty-nine per cent to Marvin L. Arnold, both of Los Angeles, California.

1,165,018 Hot water bag. Toran Blunt, Chicago, Illinois.

1,625,166 Trousers supporter. Henry M. Siegel, Malden, Massachusetts.

1,625,187 Foot pad. William T. Birch, Chicago, Illinois.

1,625,383 Sectional airbag. Herbert K. Wheelock, Akron, Ohio.

1,625,460 Pneumatic tube. Walter L. Fairchild, New York, N. Y.

1,625,679 Automobile tire. George D. Pearson, Montreal, Quebec, Canada.

1,625,742 Resilient tire. Edgar W. Perry, Boston, Massachusetts.

April 26, 1927*

1,626,276 Protecting covering for rubber sheets. Gustavus J. Esselen, Jr., Swampscott, Massachusetts.

1,626,294 Combination dust cap and tire gage. Harry L. McPherson, Memphis, Tennessee, assignor by direct and mesne assignments, to A. Schrader's Son, Inc., Brooklyn, New York.

1,626,302 Playing ball. Robert W. Rost, Newark, New Jersey, assignor of one-half to Andrew F. Bigger, New York, N. Y.

1,626,417 Boot. Leslie H. L'Hollier, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,626,433 Headband. Raymond K. Siner, assignor to North American Lace Co., both of Philadelphia, Pennsylvania.

1,626,511 Vehicle tire. John T. Clark, Provo, Utah.

1,626,512 Pneumatic tire. John T. Clark, Provo, Utah.

1,626,533 Figure of animate objects. Katharina Hergershausen, Berlin, assignor to the Firm Mittelland Gummiwerke Aktiengesellschaft, Hanover-Linden, both in Germany.

1,626,563 Parachute with pneumatic tire. Friedrich Simon, Freiburg-Breisgau, Germany.

May 3, 1927*

1,626,965 Fire kindling material. Peter L. Paulson, Clinton, Minnesota.

1,627,255 Covered elastic thread or cord. Julius B. Smith, assignor to The American Mills Co., both of Waterbury, Connecticut.

1,627,287 Flexible belt for vehicles. Adolphe Kégresse, Paris, France.

1,627,480 Combination dust cap and lock nut. Arthur T. Christian, Glenview, Illinois.

1,627,497 Knee protecting device. Bartolo Gamino, Pigeon, Michigan.

1,627,523 Face mask. Adrian K. Morris, Atlanta, Georgia.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Dominion of Canada

April 12, 1927

269,751 Bathing chair. Joseph Sommer, Elizabeth, New Jersey, U. S. A.

269,807 Pneumatic tire. The National Standard Co., assignee of Arthur C. Hopkins, both of Niles, Michigan, U. S. A.

April 19, 1927

269,945 Thumb protector. Mary Thomson, Laura, Saskatchewan, Canada.

269,973 Quick opening separable fastener. The Kaufman Rubber Co. (Ontario), Ltd., assignee of Lorne B. Koenig, both of Kitchener, Ontario.

270,008 Baseball. A. G. Spalding & Brothers, New York, N. Y., assignee of Addison T. Saunders, Akron, Ohio, both in U. S. A.

270,009 Sport ball valve. A. G. Spalding & Brothers of Canada, Ltd., Brantford, Ontario, assignee of Milton B. Reach, Springfield, and William W. MacDonald, Chicopee, both in Massachusetts, U. S. A.

270,024 Battery container. The Willard Storage Battery Co., assignee of Carl J. Dunzweiler and Malvern W. Severance, all of Cleveland, Ohio, U. S. A.

April 26, 1927

270,066 Pulley. Charles R. Griffith, Portland, Oregon, U. S. A.

270,080 Chassis suspension. Edward Brice Killen, London, E. C. 4, England.

United Kingdom

April 6, 1927

265,598† Baby soother. H. Drescher, 3 Hacklanderstrasse, Solln, near Munich, Germany.

265,655 Road sign blocks. T. J. Priestman, Cupro Foundry, Leopold street, Birmingham.

265,721 Trouser stretcher. W. E. Jones, 144 Witton street, Northwich, Cheshire.

265,844 Eye washing apparatus with rubber bulb. W. Strunz, Allersberg, near Nuremberg, Germany.

265,871 Typewriter supports. W. F. H. W. Sthamer, Peltzer, Hempell & Co., Chilehaus, Hamburg, Germany.

265,942† Tire jacket and cover. A. M. Pinto, 118 Rua General Camara, Rio de Janeiro.

265,991† Accumulator box buffers. C. I. Pfalzgraf, 1 Enzianstrasse, Lichterfelde, Berlin, Germany.

April 13, 1927

266,015 Compound sheet material for mattress. N. L. Derham, 31A, Spray street, Woolwich, London.

266,032 Bottle stopper. H. Woolstencroft, 36, Blomfield Road, Springwood Estate, Allerton, and A. E. Foxcroft, 37, South Castle street, both in Liverpool.

266,041 Rubber receptacles. A. Fraser, Factory Lane, Croydon, Surrey.

266,077 Horseshoe tread. S. W. Orr, Ballyminstra, Lisbane Post Office, County Down, Ireland.

266,080 Gaiters. M. Oliver, 17, Argyle street, Glasgow, Scotland.

266,117 Road vehicle signals. G. C. Audsley, Church Stile House, Cobham, Surrey.

266,129 Detachable tread band for twin tires. S. J. Boys, New Mills, Wednesbury Road, Walsall.

266,340† Foot arch support. H. Sochor, 20 Blasistrasse, Höngg-Zürich, Switzerland.

April 21, 1927

266,385† Insulated cable covering. M. Sieverts Fabriks Aktiebolag, 7 Esplanaden Sundbyberg, Sweden.

266,394 Traffic guidance blocks. H. W. B. Pring, 50, Russell Road, West Kensington, London.

266,465 Paper machine suction box employing rubber bearing. India Rubber, Gutta Percha & Telegraph Works Co., Ltd., 106, Cannon street, London, and B. Walkley, Cranbrooke, Althorne, Chelmsford, Essex.

266,507 Inflatable ball. W. Sykes, Ltd., Yorkshire Athletic Goods Manufactory, Westfield Road, Horbury, and W. J. Wycherley, Ashbourne Villa, Springstone avenue, Ossett, both in Yorkshire.

266,577 Bunion protector. Scholl Manufacturing Co., Ltd., Granville Square, London (W. M. Scholl, Chicago, Illinois, U. S. A.).

266,587 Collapsible tubes or containers. F. L. Macdonald, 10 Spruce street, Waltham, Massachusetts, U. S. A.

April 27, 1927

266,739 Spectacle attachment. F. Birkenstein & Co., Frankfort-on-Main, Germany, assignees of O. Uhl, 98 Bahnhofstrasse, Zurich, Switzerland.

266,797 Galvanic battery separator. Foolprufe Patent Accumulator Co., Ltd., Kettering Road, Market, Harborough, and F. J. Brown, The Green, Bitteswell, near Lutterworth, both in Leicestershire.

266,904 Paving block. T. Blagburn, Surveyor's Offices, Ashley Road, Hale, Cheshire.

266,936 Gramophone connection. C. G. Hibbard, 75, Arundel street, Sheffield.

267,040 Band for shoe. F. S. Bozza, 168 Riviera Chiaia, Naples, Italy.

†Not yet accepted.

Germany

442,785 Protective rubber cover for use in gynaecological examinations and obstetrics. Dr. Wilhelm Sanzenbacher, Kornwestheim.

443,156 Rubber roll, especially for wool washing machines. Continental-Caoutchouc-und Gutta-Percha-Compagnie, Hannover.

443,357 Material for stopping up inner tubes. Dr. Karl Albert Schaller, Safienstrasse 142, Karlsruhe.

443,417 Pessary. Elizabeth Saur, née Thiel, Schloszstrasse 6, Berlin-Hermsdorf.

443,543 Air cushion for saddles of bicycles and the like. Carl Loch, Landshut, Bavaria.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section (1) (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

April 12, 1927, Act of February 20, 1905

226,474 Badger—inside tire sleeves, tire flaps, plasters, tire and tube patches, repair kits, radiator hose, tubing and fan belts. The Badger Rubber Works, Milwaukee and Cudahy, Wisconsin.

226,505 Large Letter: "T", enclosing the words. "Re-New Old Tires"—repaired tire casings. Thomas P. Tivy, St. Louis, Missouri.

226,576 Naiad—sanitary aprons, step-ins and shadow skirts. The C. E. Conover Co., New York, N. Y.

226,577 Naiad—play balls. The C. E. Conover Co., New York, N. Y.

226,578 Naiad—bathing bags. The C. E. Conover Co., New York, N. Y.

226,591 White Beauty—stuffing box rings and pump collars. Union Rubber & Asbestos Co., Trenton, New Jersey.

226,616 Outlined cross section of a tire casing, with narrow rectangular strip, wholly within the casing tread shown, and joined at one end at right angles with the periphery of said tread at its center, with an arrow, the head of which is within the tread, pointing in a straight line at the inner end of the strip —tires. Virgil Charles Anderson, Pleasant Grove, California.

Chemical patents will be found on page 141. *Machinery and Process Patents on pages* 146-147.

April 19, 1927, Act of February 20, 1905

226,689 TUO TONE—garters. Sid Levy, San Francisco, California.

226,692 ARGOSY—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.

226,693 ALLSTATE—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.

226,695 CLUB HOUSE—shoes. The Sportocasin Co., Yarmouth, Maine.

226,705 The word: "BANGER" enclosed within a circle—transmission disks. The Badger Rubber Works, Milwaukee and Cudahy, Wisconsin.

226,746 MASSASOIT—inner tubes for pneumatic tires. The Fisk Rubber Co., Chicopee Falls, Massachusetts, and Cudahy, Wisconsin.

226,782 RUBBERLENE—rubber solvent naphtha. Anderson-Prichard Oil Corporation, Oklahoma City, Oklahoma.

226,817 Color mark in contrasting colors, white, red, white—patch. Dixie Manufacturing Co., Jackson, Mississippi.

226,820 GRIP-WEAR—gloves. The Gates Rubber Co., Denver, Colorado.

226,826 RIALTO—inner tubes of rubber compound. Public Service Tire & Rubber Co., Inc., Brooklyn, New York.

226,855 CASTELAINE MODES—shoes, etc. Milton Lichtenstein, doing business as Milton Lichtenstein & Co., New York, N. Y.

April 19, 1927, Act of March 19, 1920

226,911 HARWOOD—tires, casings and inner tubes. The Richland Rubber Co., Mansfield, Ohio.

April 26, 1927, Act of February 20, 1905

226,949 Word: "DEARBORN" beside which is a shield containing the letters: "S R"—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.

226,974 NAIAD—sheeting. The C. E. Conover Co., New York, N. Y.

226,979 Pennant containing the word: "DOLLARWEB"—suspenders. Marshall Field & Co., Chicago, Illinois.

227,018 Representation of a child one hand holding a lighted candle, the other balancing a tire upon his shoulder—soapstone, uncured sheet rubber and uncured camel back rubber stock for tire repairing, uncured sheet rubber with vulcanized backing and tire flap material. The Fisk Rubber Co., Chicopee Falls, Massachusetts, and Cudahy, Wisconsin.

227,023 DAISY—horseshoe and ring pitching games. Schacht Rubber Manufacturing Co., Huntington, Indiana.

227,099 SUPER-FLEX—belting. Union Rubber & Asbestos Co., Trenton, New Jersey.

April 26, 1927, Act of March 19, 1920

227,152 STABILIZED—tires. The Dayton Rubber Manufacturing Co., Dayton, Ohio.

227,160 GRAND BANK—boots, shoes and overshoes. Hood Rubber Co., Watertown, Massachusetts.

227,164 The word: "FISK" enclosed by a double circle containing the words: "CIRCLE MADE"—inner tubes for pneumatic tire casings. The Fisk Rubber Co., Chicopee Falls, Massachusetts, and Cudahy, Wisconsin.

227,170 RAYNBOOT—boots, shoes, overshoes and arctics. Cambridge Rubber Co., Cambridge, Massachusetts.

May 3, 1927, Act of February 20, 1905

227,240 Representation of two figures pulling on a piece of material—belts, suspenders and garters. DeWitt Fox, New York, N. Y.

227,306 ALBALITH—lithopone used as a filler in the compounding of rubber, etc. The New Jersey Zinc Co., Newark and Franklin, New Jersey.

227,312 Oval containing the words: "THE BIG FOUR SHOE"—shoes. Charles Roy Sharood, doing business as the Shoe Specialty Co., St. Paul, Minnesota.

227,355 Triangle at the top of which is the word "WONDERWEAR," in the center a circle containing the initials B F; at the bottom the initials: N.Y.—shoes. B. Friedman Shoe Co., Inc., New York, N. Y.

227,375 NAIAD—dress shields, etc. The C. E. Conover Co., New York, N. Y.

227,416 The words: "FIT" and "RITE" separated by the representation of a foot—shoes. The Hecht Co., Washington, D. C., doing business as The Hub and Hecht Brothers, Baltimore, Maryland, and New York, N. Y.

New Zealand

March 10, 1927

24,773 MATI—puncture sealing composition. William Shannahan, Ryrie street, East Geelong, Victoria, Australia.

24,793 Representation of a figure composed of tires and the word: "BIBENDUM"—rubber and gutta percha goods. Michelin et Cie, Clermont-Ferrand, France.

Dominion of Canada

Registered

April 19, 1927

41,375 Word: "CANTERBURY"—rubbers, suspenders, garters, etc. The T. Eaton Co., Ltd., Toronto, Ontario, and Winnipeg, Manitoba.

41,376 Word: "RENOWN"—rubbers, garters, suspenders, etc. The T. Eaton Co., Ltd., Toronto, Ontario, and Winnipeg, Manitoba.

May 3, 1927

41,418 Word: "EZEON"—heels, soles, etc. Federal Rubber Manufacturing Co., Ltd., Toronto, Ontario.

United Kingdom

April 6, 1927

476,332 LINATEX—crepe sheets. The Wilkinson Process Rubber Co., Ltd., 9-11 Old Market Square, Kuala-Lumpur, Federated Malay States.

476,333 SOLATEX—prepared crepe in sheets and soles. The Wilkinson Process Rubber Co., Ltd., 9-11 Old Market Square, Kuala-Lumpur, Federated Malay States.

476,334 SOLUFIX—rubber solution. The Wilkinson Process Rubber Co., Ltd., 9-11 Old Market Square, Kuala-Lumpur, Federated Malay States.

477,746 GRIPOMARK—rubber lined canvas hose. Lewis & Tylor, Ltd., Gripoly Mills, Sloper Road, Cardiff.

April 13, 1927

463,803 Fancy design containing the words: "GUTTA PERCHA & RUBBER LIMITED," in the center the initials: "G P"—boots and shoes. Gutta Percha & Rubber, Ltd., 47 Yonge street, Toronto, Canada.

463,804 Fanciful design containing the words: "GUTTA PERCHA & RUBBER LIMITED" and the initials: "G P"—machine belting and tires. Gutta Percha & Rubber, Ltd., 47 Yonge street, Toronto, Canada.

463,805 Fanciful design containing the words: "GUTTA PERCHA & RUBBER LIMITED" and the initials: "G P"—tubular hose. Gutta Percha & Rubber, Ltd., 47 Yonge street, Toronto, Canada.

468,203 Square containing the representation of a ship and the words: "THE COLUMBUS RUBBER CO., OF MONTREAL LIMITED" and "RUBBER FOOTWEAR"—boots and shoes. The Columbus Rubber Co. of Montreal, Ltd., 1349 Demontigny street east, Montreal, Canada.

B474,678 Square containing the words: "THE HANDIMAC FEATHERLITE & STORMPROOF," and the initials: "G A S"—mackintoshes. Gerrish, Ames & Simpkins, Ltd., 63, Carter Lane, London, E. C. 4.

476,706 RUGGABIFF — inflatable ball. Harold Falkner Anns, 159, Victoria street, London, S. W. 1.

476,784 Circle containing the representation of a leg and the words: "QUALITY FIRST," "BOSTON GARTER" and "VELVET GRIP"—suspenders. George Frost Co., 551 Tremont street, Boston, Massachusetts, U. S. A.

476,785 Circle containing the representation of a leg and the words: "WIDEWEB BOSTON GARTER," "VELVET GRIP," and "QUALITY FIRST"—suspenders. George Frost Co., 551 Tremont street, Boston, Massachusetts, U. S. A.

477,428 Representation of a sailor pulling a piece of elastic, in the center of the representation the head of a sailor beneath whom are the words: The "MIDDY" and "With a long long pull and a strong strong pull"—elastic sandalings, webs, and cords. Tubbs, Lewis & Co., Ltd., 29, Noble street, London, E. C. 2.

478,450 GALLOPIN' GUS—rubber and gutta percha goods. Dean's Rag Book Co., Ltd., 2, Newington Butts, London, S. E. 1.

478,817 METAFIX—sole or heel plate or pad. Phillips' Patents, Ltd., 142, Old street, London, E. C. 1.

April 20, 1927

475,553 SOLAR—tires. R. Woolf & Co. (Rubber), Ltd., Alric avenue, Bruce Road Harlesden, London, N. W. 10.

April 27, 1927

477,102 Representation of a fort beneath which is the word: "HELSINBORG"—balls and toys. Helsinborgs Gummifabriks Aktiebolag, Furutorpsgatan, Block Esculap 1, 2, 14, 15, 16 & 17, Helsinborg, Sweden.

Designs

United States

72,431 Tire casing or similar article. Term 14 years. Frederick Leopold, Jr, Harmonville, assignor to Lee Rubber & Tire Corporation, Conshohocken, both in Pennsylvania.

72,472 Tire. Term 3½ years. Truman S. Caldwell, assignor to Racine Horseshoe Tire Co., both of Racine, Wisconsin.

72,473 Tire. Term 14 years. Truman S. Caldwell, assignor to Racine Horseshoe Tire Co., both of Racine, Wisconsin.

72,474 Shoe sole. Term 7 years. Edwin Calvin, Squantum, assignor to Bearfoot Sole Co., Inc., Boston, both in Massachusetts.

72,484 Tire. Term 14 years. Thomas C. Marshall, Mount Savage, Maryland.

72,485 Tire. Term 14 years. Thomas C. Marshall, Mount Savage, Maryland.

72,553 Tire. Term 14 years. Wade S. Galvin, assignor to The Akron Standard Mold Co., both of Akron, Ohio.

Dominion of Canada

7,503 Tire tread. Gutta Percha & Rubber, Ltd., Toronto, Ontario.

7,522 Tire. The Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ontario.

Germany

982,417 Bulb syringe. Fritz Jensen, Ludwigstrasse 22, Hannover.

982,724 Rubber motor for toy boats. Arkady Jospé, Sebastianstrasse 69, Berlin.

983,261 Air cushion. Aug. Vinhage, Borghorst i W.

983,308 Stocking protector of thin rubber. Franz Noetzel, Hasselbrookstrasse 165, Hamburg.

983,341 Swimming device. Münden-Hildesheimer Gummiwaaren-Fabriken, Gebi. Wetzell, A.-G., Hildesheim.

983,485 Barbiner shoe of rubber. J. Landsberger, Berlin.

983,611 Rubber apparatus for washing and massaging the back. Wilhelm Hammerstroem, Voszstrasse 41, Hannover.

983,767 Rubber stopper and tool for inserting it. Luftfahrzeug-Gesellschaft m. b. H., in L., Berlin.

983,778 Endless conveyer belt of balata, gutta percha or fabric combined with sponge rubber. Gummi-und Asbest-Compagnie Reinhard Stiehler & Böttger, Dresden.

983,798 Small cap for sales-girls. "Vulkan" Gummiwarenfabrik Weiss & Boessler, A.-G., Leipzig-Lindenau.

983,812 Heel of vulcanized old rubber. Max Keller, Schanzenstrasse 56-62, Hamburg.

983,947 All rubber plaque for suspenders. Ernst Sauer, Mühlenweg 45a, Barmen.

984,277 Rubber hose. Julius Römpler A.-G., Zeulenroda.

984,374 Rubber face brush. Firma E. Männel, Schönheide i. Erzgeb.

984,462 Floor covering lined with sponge rubber. Bruno Lindemann, Ritterstrasse 77-78, Berlin.

985,553 Rubber hose, neue Gummi-gamaschen G. m. b. H., Neue Jakobstrasse 8, Berlin S. 14.

985,554 Thin rubber bandage. Neue Gummigamaschen G. m. b. H., neue Jakobstrasse 8, Berlin S. 14.

985,656 Rubber pouch. Heinrich Klouten, Potsdamerstrasse 29, Berlin W. 35.

985,720 Rubber sole. Ernst Siegling, Hagenstrasse 26-27, Hannover.

985,733 Brush with rubber body acting as dust suction agent. Berliner Gummiwarenfabrik Paersch & Kerstan, Belle-Alliancestrasse 3, Berlin S. W. 61.

985,912 Transport wheel for hydroplanes, with rubber tire. Ernst Schnabel, Hansastrasse 18, Kiel.

985,991 Flexible massaging roller of rubber that conforms to all body shapes. Hans Engel, Geisbergstrasse 23, Berlin W. 50.

986,052 Rubber cover for knobs on lids of water-kettles, etc. August Pescht, Bunsenstrasse 2, Düsseldorf.

986,339 Bed pan. Hannoversche Gummiwerke, Excelsior A.-G., Hannover-Limmer.

986,451 Non-skid for crepe-rubber soles. Alice Freifrau von Brand, geb. von Bergmann, Tübingen.

986,549 Valve for twin bellows of rubber. Continental Caoutchouc and Gutta-Percha-Compagnie, Hannover.

Prints

United States

9,788 IF FASHION CAME TO THIS YOU'D CHANGE YOUR GARTERS OFTENER. Garters. A. Stein & Co., Chicago, Illinois. Published December 23, 1926.

Legal Decisions

Goodyear Tire & Rubber Co. v. Thomas E. Robertson, Commissioner of Patents. District Court, District of Maryland, April 2, 1927.

The right to registration of diamond tread for automobile tires was denied in this case because they were a functional part of the tire.

Customs Appraisers' Decision

Rubber Balls, Celluloid Dolls, Toys. Protests 980,373, etc., of S. H. Kress & Co., New York. Merchandise classified as toys at 70 per cent ad valorem under paragraph 1,414, tariff act of 1922, is claimed dutiable at 60 per cent under paragraph 31 or at 30 per cent under paragraph 1,402. Opinion by J. Sullivan. Celluloid dolls were held dutiable at 60 per cent under paragraph 31 and colored rubber balls at 30 per cent under paragraph 1,402. United States v. Stewart (12 Ct. Cust. Appls. 533; T. D. 40,734) followed.—*Treasury Decisions*, Volume 51, No. 7, p. 28.

No. 2639. Protest 198128-G of Chicle Development Co., New York. Merchandise classified at 10 cents per pound under paragraph 25, tariff act of 1922, as crude gum chicle is claimed free of duty under paragraph 1584. Opinion by J. McClelland. It was stipulated that the merchandise consists of crown gum similar to that passed upon in Chicle Development Co. v. United States (T. D. 41894). On the authority of that decision the claim for free entry under paragraph 1584 was sustained.—*Treasury Decisions*, Volume 51, No. 16, p. 34.

Patent Suits

No. 887,997, E. B. Cadwell, vehicle tire, appeal filed February 1, 1927, C. C. A. (2d Cir.), Doc. 9522, E. B. Cadwell et al. v. Firestone Tire & Rubber Co.—*Official Gazette*, Volume 356, page 986.

No. 1,149,580, Hoffmann & Gottlob, caoutchouc substance and vulcanization product thereof, suit filed August 6, 1923, D. C., S. D. N. Y., Doc. E 27/72, The Grasselli Chemical Co. v. National Aniline & Chemical Co., Inc. Patent held invalid as to claims 1 and 4, and bill dismissed February 16, 1927.—*Official Gazette*, Volume 357, page 4.

No. 1,371,662, C. W. Bedford, art of vulcanizing caoutchouc; 1,477,805, same, accelerator for the vulcanization of caoutchouc substances, suit filed February 9, 1927, D. C., N. D. Ohio (E. Div.), Doc. 2126, The Goodyear Tire & Rubber Co. v. Rubber Service Laboratories Co., Inc.—*Official Gazette*, Volume 356, page 753.

No. 1,411,231, M. L. Weiss, Vulcanization accelerator, appeal filed March 18, 1926, C. C. A. (3d Cir.), Doc. 3470, Dovan Chemical Co. v. Corona Cord Tire Co.—*Official Gazette*, Volume 356, page 987.

No. 1,538,303, C. R. Short, transmission belt, suit filed February 9, 1927, D. C., S. D. Ohio (E. Div.), Doc. 508, The Dayton Rubber Mfg. Co. v. The Dorman Automotive Parts Co.—*Official Gazette*, Volume 356, page 754.

No. 1,482,217, A. B. Broluska, tire structure, suit filed March 8, 1927, D. C., E. D. Michigan. (S. Div.), Doc. 1924, A. B. Broluska v. S. Waze (Belle Tire Corp.).—*Official Gazette*, Volume 357, p. 535.

No. 1,612,643, J. F. Mulholland, balloon toy, suit filed March 9, 1927, D. C., S. D. N. Y., Doc. E 40/382, C. M. Pfeifer v. J. Meidenberg.—*Official Gazette*, Volume 357, p. 535.

No. 943,358, P. W. Litchfield, tire (6th Cir.), Doc. 4529, The Goodyear Tire & Rubber Co. v. Michelin Tire Co. Decree affirmed, claims 1, 2, and 4 held invalid, March 7, 1927.—*Official Gazette*, Volume 357, p. 788.

Trade-Marks Canceled

No. 220,617. Tire flaps and fan belts. The Better Tires Co., Chicago, Illinois. Registered November 9, 1926. Canceled April 6, 1927.—*Official Gazette*, Volume 357, p. 536.

Adjudicated Patents

(D. C. Mass.) The Woodley patent, No. 1,156,122, for fibrous composition and process of manufacture, held not infringed. Richardson Co. v. Hood Rubber Co., 16 F. (2d) 785.—*Official Gazette*, Volume 356, page 754.

(C. C. A. N. J.) The Stedman patent, No. 1,482,952, for reinforced rubber flooring and process of manufacture, held invalid. Stedman v. Puritan Rubber Mfg. Co., 16 F. (2d) 742.—*Official Gazette*, Volume 356, page 754.

(C. C. A. Pa.) The Allen patent, No. 1,549,177, for apparatus for molding rubber articles, claims 2-5, 7-9, and 12-16 held valid and infringed. Allen v. Wingerter, 17 F. (2d) 745.—*Official Gazette*, Volume 358, p. 276.

A. S. T. M. MEETING

The Thirtieth Annual Meeting of the American Society for Testing Materials will be held June 20-24, 1927, at French Lick Springs Hotel, French Lick, Indiana.

The third session of the meeting will be devoted to rubber, textiles, coal and timber, at which time reports and papers will be read by members of Committee D-11, according to the following program:

Report of Committee D-11; On Rubber Products.—F. G. Breyer, Chairman.

A Study of the Influence of Moisture on Rubber Testing.—F. S. Conover and H. A. Depew. Since moisture changes have a very large influence on unvulcanized rubber stocks before and after milling, a humidity control cabinet should be used for the storage of these stocks. Data of a series of tests on the control of humidity are presented.

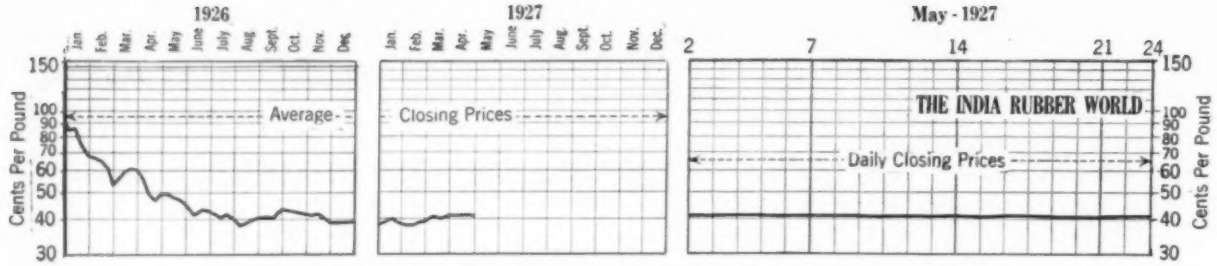
Report of Sectional Committee: On Specifications for Rubber-Lined Fire Hose.—P. L. Wormeley, chairman. A report of the committee's activities in developing a single standard specification for fire hose. The committee is functioning under the procedure of the American Engineering Standards Committee.

Report of Committee D-13: On Textile Materials.—W. F. Edwards, chairman. Reports the authorization of a new sub-committee on raw cotton. Presents new specifications for Cuban (jute) raw sugar bags and for tolerances for light and medium cotton fabrics. Submits a method for identification of textile fabrics and their quantitative determination in mixed goods.

PIRELLI $4,000,000 BOND ISSUE

In order to secure more working capital and to repay loans made for constructing additions to its plants, the Pirelli Co., the leading rubber manufacturer of Italy, has recently sold a $4,000,000 issue of 7 per cent convertible gold bonds on the New York market through J. P. Morgan & Co. The issue will mature in 1952 and a cumulative sinking fund will be established to take care of the redemption.

Senator G. B. Pirelli now heads this important rubber organization, which was established fifty-six years ago and has since that time been under the continuous control of the Pirelli family. The Italian plants are owned by the Pirelli Company of Italy and the Pirelli International Co. (Brussels), the latter concern controlling companies selling Pirelli products in France, Belgium, Great Britain, Spain, and Argentina, and also operating factories in the two latter countries. The British subsidiary also owns 50 per cent of the capital stock of the Pirelli General Cable Works, Ltd., which operates two cable factories in England, the other one-half interest being owned by the General Electric Co. The Pirelli group is said to be one of the world's largest producers of electric cables and the third largest European producer of automobile tires. Total sales of the group amounted in 1926 to the equivalent, at average exchange rates for the year, of approximately $27,000,000, while the company's net current assets for the calendar year 1926 are given as $12,186,094.



Ratio Graph of New York Closing Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York Outside Market

THE crude rubber market for May was a continuation of that for April in lack of activity and steadiness of prices. For these months quotations have been subject to minor fractional variation and were virtually steady at 40¾ to 41 cents, sellers. The reduction of the exportable allowance to 60 per cent was discounted and had no disturbing effect upon the market.

Prices are practically stabilized at the present levels because of three influences, the leading one is the control of the situation exerted by the American buying organization. Next is the conviction of consumers that there is an abundance of rubber available for this year's use. The 1927 world stocks are estimated at 600,000 tons and 1927 world consumption at 390,000 tons. This confirms buyers in their policy of hand-to-mouth purchasing. Small consumers are probably operating on two weeks' to one month's supply. The heavy increase in the tonnage of reclaim used, now practically amounting to half of the crude rubber being used, serves as a further stabilizing factor.

The following taken from a late April issue of the London *Evening Standard*, indicates the British view of the rubber situation:

"Many leaders of the rubber industry in London are swinging round to the view put forward by the *Evening Standard* that the future of the industry lies in the withdrawal of the government restriction scheme. It is not unlikely that the majority of rubber men will shortly be in favor of bringing control to an end.

"The restriction regulations provide that British production shall thereafter remain at 60 per cent until the price has averaged more than 1 shilling 9 pence for three quarters, or more than 2 shillings for one quarter.

"Dutch planters will be producing to their full capacity, and will take more and more of the British share of world markets. In addition, America, the largest consumer of rubber in the world, is refusing to buy her usual quantity of rubber at such high prices, and is turning more and more to the use of reclaimed rubber.

"Production costs under the restriction scheme are much higher than they would normally be. It is estimated that 60 per cent exports cost British companies 1 shilling a pound to produce, as against only 8 pence a pound for 100 per cent exports. On this basis a price of even 2 shillings a pound for a production of 60 per cent will give only the same profit as could be earned if rubber were selling at 1 shilling 3½ pence a pound on a 100 per cent production."

Tire production in the Akron district is being maintained above 130,000 daily, with no indication of reduction in schedules. In March, 6,349,819 tires were produced in the United States. This was the largest in history. Previous peak production was 5,930,486 tires made in August, 1926.

The week ended April 30 was extremely quiet with little actual rubber moving. Factory buying was sufficient, however, to keep the market barely steady, although the bids were below quotations.

During the week ended May 7, dull conditions prevailed again, with no sustained demand evident. A slight stiffening of the market occurred but trading was restricted, due to the firmness of the eastern markets which are slightly over New York parity and impose a limitation on local trading.

The market of the week ended May 14 duplicated that of the week before. Trading was scattered and on a small scale by factories seeking small lots. As a whole the market was steady. Crepe was a trifle firmer and in some demand.

The week terminated May 21 showed a repetition of the earlier weeks of the month as to general dullness. The far eastern markets ruled too high for New York trading. The only activity shown was in Paras which advanced 1½ to 2 cents, due to a little factory demand. Paras as a rule, however, were dull and quiet earlier in the month, and balatas were dull and neglected.

The last week of the month opened with the same lack of trading and factory interest with prices unchanged around the 41-cent level.

Importations of all grades in April were 48,673 tons, compared with 32,678 tons one year ago. Plantation arrivals for April were 45,843 tons, compared with 30,766 tons one year ago. Total importations of plantation rubber for four months ended March 31, were 146,929 tons, compared with 139,147 tons for the corresponding period of 1926. Total importations of all grades of rubber for the four months ended April 30 were 157,312 tons, compared with 148,119 tons for the corresponding period of 1926.

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

Plantations Sheet	April, 1927						May, 1927																
	25	26	27	28	29	30	2	3	4	5	6	7	9	10	11	12	13	14	16	17	18	19	20	21
Ribbed smoked	40⅞	40¾	40¾	40⅝	40⅝	40¾	40¾	40⅝	40¾	41	40⅞	40⅞	40⅞	40⅞	40¾	40¾	40¾	41	40⅞	41	41	40⅞	40⅞	40⅞
Crepe																								
First latex	41⅛	41	41	40⅞	41	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛	41⅛
No. 2 blanket	38½	38½	38¾	38½	38½	38½	38½	38½	38½	38⅝	38¾	38⅝	38⅝	38½	38½	38⅜	38½	38½	38¼	38¾	38¾	38⅝	38⅝	38⅝
No. 3 blanket	38⅛	38⅛	38	38	37⅞	37⅞	37⅞	37⅞	38⅛	38⅛	38⅛	38½	38¾	38⅝	38⅝	38	38	38⅛	38⅛	38¼	38⅜	38¼	38⅛	38¼
No. 4 blanket	37⅛	37¼	37⅛	37⅛	37⅛	37⅛	37½	37⅛	37⅛	37⅛	37⅛	37⅛	37⅜	37¼	37¼	37⅛	37¼	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37½
Thin clean brown	38⅛	38⅛	38⅛	38	38	38	38	38	38⅛	38⅛	38⅜	38¼	38¼	38⅛	38⅛	38⅛	38⅛	38⅛	38¼	38⅛	38⅜	38¼	38⅛	38¼
Rolled brown	35⅛	35⅛	35¼	35½	35¼	35¼	35½	35½	35½	35⅝	35⅝	35⅝	35½	35½	35½	35½	35⅜	35½	35½	35⅞	35⅞	35¾	35¼	35¼
Off latex	40¼	40¼	40⅝	40½	40¼	40⅝	40⅞	40¼	40½	40⅞	40¼	40¼	40¼	40¼	40⅝	40⅛	40¼	40⅝	40¼	40¼	40⅞	40⅞	40⅞	41

RUBBER AFLOAT TO THE UNITED STATES

(Figures in Long Tons)

Week ended	British Malaya	Ceylon	East Indies	London and Liverpool	Totals
April 30.....	5,250	1,033	1,336	324	7,943
May 7.....	5,764	431	1,778	464	8,437
May 14.....	4,749	576	1,054	1,327	7,700
May 21.....	4,853	505	2,125	897	8,380

New York arrivals of crude rubber, May 1 to 20, were 24,500 tons. Arrivals for the full month are estimated at 32,000 tons, compared with 48,673 tons for April.

New York Quotations

Following are the New York spot and future rubber quotations for one year ago, one month ago and May 24, the current date:

Plantation Hevea	May 24, 1926	April 25, 1927	May 24, 1927
Rubber latex (Hevea)...*gal.*	$1.80 @	$1.50 @	$1.50 @
CREPE			
First latex crepe, spot	.47 @.47¼	.41¼ @.41½	.41½ @.41⅝
June	.46½ @.47	.41 @.41¼	.41¼ @
July-September	.43 @.43¼	.42 @.42¼	.42¼ @.42½
October-December	.42½ @.42¾	@	.42¾ @.43
January-March	.42 @.42½	@	.43¼ @.43½
Off latex, spot	.46 @.46½	@	.41½ @
Amber No. 2, spot	.42 @.42½	.38½ @.38¾	.39 @
June	.41½ @.42	.38¾ @.39	.39¼ @
July-September	.41 @.41½	.39¼ @.39½	.39½ @
October-December	.40 @.41	@	.39¾ @
Amber No. 3, spot	.43 @.44½	.38¼ @	.38¼ @.38½
Brown, thin, clean	.42 @.42½	.38 @	.38½ @.38¾
Brown, specky	.41½ @.42	.37 @	.38 @
Brown, roll	.38 @.39	.35½ @	.36¼ @
Sole crepe	.80 @	@	@
Sheet			
Ribbed, smoked, spot	.46½ @.47	.41 @.41¼	.41 @
June	.46½ @	.41¼ @.41½	.41¼ @
July-September	.43½ @	.41¾ @.42	.42 @.42⅛
October-December	.42½ @	.42⅝ @.42¾	.42¾ @
January-March	.43 @	@	.43 @
East Indian			
PONTIANAK			
Banjermassin	.17¼ @	.09 @.10	.09 @
Pressed block	.29½ @	.16 @.17	.16 @
Sarawak	@	.10 @	.09 @
South American			
PARAS			
Upriver, fine	*.38 @	.33 @	.37 @
Upriver, fine	*.55 @	*.43½ @	*.45½ @
Upriver, medium	.33 @	.29 @	.33 @
Upriver, coarse	.24 @	.24½ @	.26 @
Upriver, coarse	*.42 @	*.38½ @	*.38 @
Islands, fine	.32 @	†.31 @	.33 @
Islands, fine	*.53 @	*.42 @	*.43 @
Acre, Bolivian, fine	.39 @	.33½ @	.38 @
Acre, Bolivian, fine	*.55 @	*.44 @	*.46 @
Beni, Bolivian	.39 @	.34 @	.38 @
Madeira, fine	.39 @	.33½ @	.37 @
Peruvian, fine	.38 @	.32 @	.36 @
Tapajos, fine	.36 @	.32 @	.35 @
CAUCHO			
Upper Caucho ball	.25 @	.26 @	.27 @
Upper Caucho ball	*.43 @	*.38½ @	*.39 @
Lower Caucho ball	.23 @	.24½ @	.25 @
Maniçobas			
Ceará negro heads	†.40 @	.24 @	.24 @
Ceará scrap	†.20 @	.12 @	.12 @
Manicoba, 30% guarantee	†.37 @	.22 @	.23 @
Mangabiera, thin sheet	†.40 @	.24 @	.23 @
Centrals			
Central scrap	.21 @	.25 @	.25 @
Central wet sheet	.16 @	.17 @	.17 @
Corinto scrap	.21 @	.25 @	.25 @
Esmeralda sausage	.21 @	.25 @	.25 @
Guayule			
Duro, washed and dried	.37 @	.33 @	.33 @
Gutta Percha			
Gutta Siak	.32 @	.21½ @.22	.20½ @
Gutta Soh	@	.38 @.40	.38 @
Red Macassar	3.50 @	3.00 @	3.00 @
Balata			
Block, Ciudad Bolivar	.63 @	.37 @.38	.38 @
Colombia	.48 @	.35 @.36	.36 @
Manaos block	@	.42 @	.42 @
Panama	.48 @	@	.36 @
Surinam, sheet	.82 @	.62 @	.62 @
amber	.85 @	.66 @	.66 @
Chicle			
Honduras	‡.64 @	‡.65 @	‡.65 @
Yucatan, fine	‡.65 @	‡.65 @	‡.65 @

* Washed and dried crepe. Shipment from Brazil.
† Nominal. ‡ Duty paid.

London

During the last week of April the market held very steady and firm. The new restriction quarter started May 1 with a steady tone throughout the session. Spot and May closed at 19⅝ pence while distant positions finished unchanged to ⅛ pence higher. As May progressed the market ruled fairly active to dull. Prices for spot and May positions were subject to occasional fluctuations of ⅛ pence up or down, ranging from 19¾ pence to 19⅞ pence.

In reply to a question in the House of Commons May 10, Mr. Amery, head of the Colonial office stated:

"That a large proportion of the rubber producers had voluntarily agreed to the policy of restriction of output imposed on British rubber plantations, and he saw no reason to suppose that in the long run the effect was disadvantageous to the British industry. Asked whether it would not be advisable to form a small independent committee to go into the whole question and advise as to the advantage or otherwise of retaining the Stevenson Scheme? Mr. Amery said he had the advantage of the advice of a very strong committee representing the interests concerned."

London stocks showed a net decline of 366 tons between April 30 and May 21. The weekly record is as follows: April 30, 67,034 tons; May 7, 68,187 tons; May 14, 68,041 tons; May 21, 66,668 tons.

Singapore

The market for the past month was generally steady and quiet. Stocks were firmly held and offerings too high to interest buyers.

British Malaya

RUBBER EXPORTS

An official cablegram from Singapore to the Malay States Information Agency, 88 Cannon street, London, E. C. 4, England, states that the amount of rubber exported from British Malaya during the month of April last totaled 29,041 tons. The amount of rubber imported was 13,069 tons, of which 10,027 tons were declared as wet rubber. The following are comparative statistics:

	1926		1927	
	Gross Exports Tons	Foreign Imports Tons	Gross Exports Tons	Foreign Imports Tons
January	30,452	10,237	34,946	14,995
February	30,440	8,306	27,528	11,697
March	35,012	14,800	41,346	17,462
April	23,727	10,565	29,041	13,069
Totals	119,631	43,908	132,861	57,223

Note—The above figures represent the totals compiled from declarations received up to the last day of the month for export from and import to all ports of British Malaya and not necessarily the actual quantity shipped or landed during that month.

DISTRIBUTION

The following is a comparative return of distribution of shipments during the months of March and April, 1927:

	March, 1927 Tons	April, 1927 Tons
United Kingdom	9,566	4,636
United States of America	26,126	21,397
Continent of Europe	2,231	1,490
British Possessions	718	562
Japan	2,682	930
Other foreign countries	23	26
Totals	41,346	29,041

Low and High New York Spot Prices

		May		
PLANTATIONS	1927*	1926	1925	
First latex crepe	$0.41 @$0.41⅝	$0.47 @$0.50½	$0.44¼ @$0.69½	
Smoked sheet, ribbed	.40½ @ .41	.47 @ .50½	.44¾ @ .68½	
PARAS				
Upriver, fine	.32¼ @ .37	.38 @ .43	.37¼ @ .57	
Upriver, coarse	.23¾ @ .26¾	.24½ @ .30½	.31 @ .45	
Islands, fine	.28 @ .32	.35½ @ .39	.33 @ .48	
Cameta	.....	.24 @ .29	.17½ @ .28	

*Figured to May 24, 1927.

The Rubber Exchange of New York, Inc.

Members of the Rubber Exchange on May 23 approved increasing the unit of trading from 2½ to 5 tons and expressed approval of warehouse delivery in addition to dock delivery of rubber, but did not favor a proposal to establish a central warehouse equipped for rubber storage. The proposed changes were referred to the Rules Committee for drafting into form for submission to the Board of Governors and later ratification by the membership.

The members were unanimous in the opinion that deliveries should be made from warehouses when buyers so desire. With rubber deliveries from the warehouse, certificate of quality is to be issued by graders licensed by the Exchange. It was also agreed that qualities should be so graded as to conform with those established in the outside market, with a view to establishing international types.

The membership voted that prices for trading be on the basis of 5 points, or 1-20 of a cent, rather than the prevailing basis of 10 points. A revision of the commission rate was also voted and a sliding scale adopted on a one-way basis, representing a reduction from the old average rate of approximately 40 per cent.

The members favored increasing the clearance charge from $1.50 to $2, though the contract was doubled in unit of trade. The clearance charge was also recommended at $10 per contract for members, to cover transactions in and out during trading hours, even though absent from the floor.

In the matter of grading, the Board of Governors of the Rubber Exchange has approved a scale of price differentials between the various grades of Hevea plantation rubber which shall prevail on all deliveries made during June against "new" contracts entered into on and after June 21, 1926.

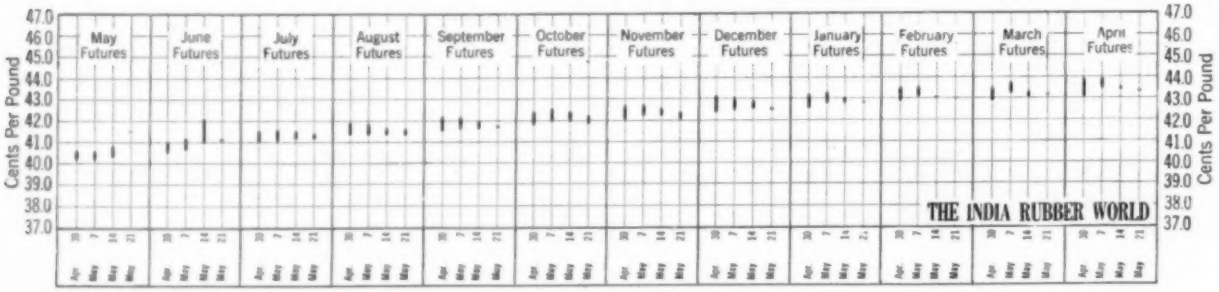
The scale of differentials follows: Off quality first latex crepe at one-half cent a pound; good F. A. Q. ribbed smoked sheets at seven-tenths cent a pound; ordinary F. A. Q. ribbed smoked sheets at 1½ cents a pound.

Trading on the Rubber Exchange from April 25 to May 23 resulted in the sale of 2,290 contracts, equivalent to 5,725 tons, as compared to 2,424 contracts and 6,000 tons the previous month. American rubber consumption in May was estimated at 34,000 tons. This is only 1,900 tons less than the actual tonnage consumed in April.

Reference to the price records below on the Rubber Exchange for May show only slight deviations during the period for any position. During the second and third weeks the high and low range disappeared.

Another market factor finds that manufacturers are practically unconcerned regarding price changes in the market while supplies are plentiful. Those who take a more extended view of the future are accumulating stocks as a reserve in anticipation of the effect of the restrictions to further advance prices in the near future.

New York Rubber Exchange—High and Low Monthly Futures—Cents Per Pound



The Rubber Exchange of New York, Inc.

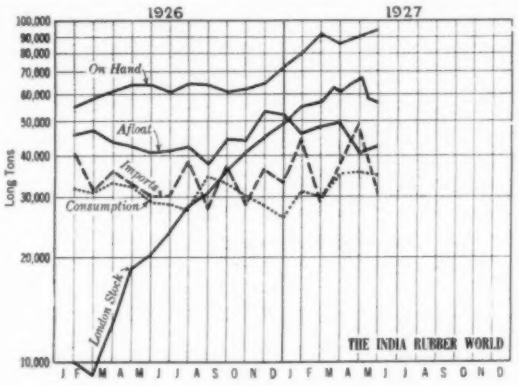
Daily Market Futures—Ribbed Smoked Sheets—Closing Prices—Cents Per Pound

1927	April 25	26	27	28	29	30	May 2	3	4	5	6	7	9	10	11	12	13	14	16	17	18	19	20	21
April	40.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
May	40.6	40.5	40.4	40.3	40.2	40.2	40.3	40.2	40.5	40.7	40.6	40.6	40.8	40.6	40.5	40.4	40.6	40.6	40.5	40.5	40.5	40.5	40.5	40.5
June	41.0	41.0	40.9	40.6	40.7	40.6	40.7	40.7	41.0	41.2	41.1	40.9	41.2	41.1	41.0	41.1	41.1	41.1	41.1	41.1	40.9	40.9	40.8	40.8
July	41.5	41.4	41.4	41.1	41.1	41.1	41.1	41.1	41.4	41.6	41.5	41.5	41.5	41.4	41.3	41.2	41.3	41.3	41.4	41.3	41.3	41.2	41.2	41.2
August	41.9	41.8	41.8	41.5	41.5	41.4	41.5	41.4	41.7	41.8	41.7	41.7	41.7	41.5	41.5	41.4	41.5	41.5	41.6	41.4	41.5	41.5	41.5	41.5
September	42.1	42.1	42.2	41.8	41.7	41.6	41.7	41.7	42.0	42.2	42.0	42.0	42.0	41.9	41.8	41.7	41.9	41.9	41.8	42.0	41.8	41.7	41.7	41.7
October	42.3	42.2	42.4	42.1	42.0	41.8	42.1	42.0	42.3	42.5	42.2	42.2	42.1	42.4	42.0	41.9	42.2	42.2	42.2	42.2	42.2	42.1	41.9	41.9
November	42.7	42.6	42.7	42.3	42.1	42.0	42.3	42.4	42.7	42.6	42.7	42.6	42.5	42.4	42.4	42.5	42.3	42.3	42.4	42.4	42.2	42.1	42.1	42.1
December	43.0	43.0	43.1	42.6	42.5	42.4	42.5	42.7	43.0	42.8	42.8	42.8	42.7	42.6	42.8	42.8	42.7	42.7	42.6	42.6	42.6	42.5	42.6	42.6
1928																								
January	43.2	43.2	43.2	42.8	42.7	42.6	42.8	43.0	43.3	43.1	43.0	43.0	42.9	42.8	43.0	43.0	42.8	42.9	42.8	42.8	42.8	42.8	42.8	42.8
February	43.5	43.5	43.4	43.1	43.0	42.9	43.1	43.2	43.5	43.4	43.3	43.2	43.1	43.0	43.1	43.1	43.1	43.1	43.0	43.0	43.0	43.0	43.0	43.0
March	43.9	43.9	43.5	43.3	43.2	43.1	43.3	43.4	43.7	43.6	43.5	43.5	43.3	43.1	43.2	43.2	43.3	43.3	43.2	43.2	43.2	43.2	43.2	43.2
April	...	...	...	...	...	...	43.5	43.6	43.9	43.8	43.7	43.7	43.5	43.3	43.4	43.4	43.5	43.5	43.4	43.4	43.4	43.4	43.4	43.4

Imports, Consumption and Stocks

The accompanying graph covers the crude rubber supply, consumption and stocks for 1926 and the first five months of 1927.

Stocks on hand in the United States advanced from 85,737 tons on March 31 to 92,756 on April 30. This exceeds by 2,756 tons



U. S. Imports, Consumption, Stocks, 1926-27

the amount estimated one month ago for April 30. Imports for April were 48,000 tons and for May were estimated at 32,000 tons. Consumption for April was 35,900 tons and for May was estimated at 34,000 tons. London stocks were above 68,000 tons from May 7 to May 14, then dropped 1,400 tons, the report on May 21 showing 66,668 tons.

UNITED STATES CRUDE RUBBER IMPORTS, CONSUMPTION AND STOCKS

			Stocks			
1925	Imports Tons	Consumption Tons	On Hand† Tons	Afloat† Tons	London Tons	Singapore and Penang Tons†
Twelve months...	384,837	389,136	51,000*	48,000*	.....	.....
1926						
Twelve months...	411,900	358,415	72,510*	52,019*	.....	.....
1927						
January	45,736	31,500	76,171	45,218	54,786	26,443
February	29,446	29,000	76,000	48,000	56,962	26,766
March	39,500	36,100	91,086	49,597	63,167	27,844
April	48,700	35,900	92,800	39,000	67,034	24,543
May (estimated)..	32,000	34,000	94,000	42,000	56,668‡	.....

* December 31, 1925 and 1926.
† The first of each month.
‡ May 21, 1927.

Ceylon Rubber Exports from Jan. 1 to Feb. 22, 1927

	Tons
To United Kingdom	2,775.38
Continent	376.35
Australia	171.64
America	6,244.90
Egypt	2.00
Africa	17.36
India	2.97
Japan	12.10
Total	9,602.70

CEYLON ANNUAL EXPORTS, 1921-1926

	Tons
For the same period last year	8,776.03
For the year 1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,367.14
1921	40,210.31

Plantation Rubber Exports from Malaya

January 1 to March 31, 1927

	From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom.....	2,703.58	3,438.61	2,674.28
British Possessions...	1,134.50	29.60	21.62
Continent of Europe..	3,212.22	658.70	782.89
United States	40,667.50	8,032.56	3,132.34
Japan	3,435.16	1,103.50	859.00
Other Countries.....	11.36	.....	.....
Totals	51,164.32	13,262.97	7,470.13

Reclaimed Rubber Market

The reclaiming industry is operating at practically capacity output to meet the very active demand. The volume of inquiries from rubber manufacturers is well sustained. Quotations remain unchanged from one month ago except in the case of No. 1 tube reclaim, which is 1 cent a pound lower.

The technical quality of reclaims of the higher qualities is being steadily improved. High quality gray and red inner tubes, containing from 25 to 30 per cent of superior tube reclaim and the usual proportion of anti-oxidant, exhibit excellent physical properties and deteriorate less in aging quality than tubes consisting of all crude rubber without selected reclaim. Similar instances of economy of crude rubber without loss of quality are possible in other high grade goods from which reclaims were formerly excluded.

New York Quotations

May 24, 1927

	Specific Gravity	Price Per Pound
Auto Tire		
Black	1.21	$0.08½ @ $0.08¾
Black, washed	1.18	.10½ @ .10¾
Black selected tires	1.20	.09½ @ .10
Dark gray	1.35	.12¾ @ .13¼
Light gray	1.38	.13½ @ .14
White	1.40	.15½ @ .16
High Tensile		
Super-reclaim, No. 1 Black	1.20	.17½ @ .18
No. 2 Black	1.20	.14½ @ .15
High tensile red	1.20	.15 @ .15½
Shoe		
Unwashed	1.60	.08¼ @ .08½
Washed	1.50	.11 @ .11¼
Tube		
No. 1	1.00	.17½ @ .18
No. 2	1.18	.14 @ .14½
Miscellaneous		
Red	1.35	.15 @ .15¼
Truck tire, heavy gravity	1.55	.08½ @ .09
Truck tire, light gravity	1.40	.09 @ .09½
Mechanical blends	1.60	.08 @ .08½

SHIPMENTS DURING 1926 OF CRUDE RUBBER FROM SALINA CRUZ, Mexico, represent a great advance over those for 1925, the totals being: 1925, 19,161 pounds, value $11,837; 1926, 101,056 pounds, value $48,228.

The Market for Rubber Scrap

Collections of scrap continue to improve with the coming of milder weather. As was the case in April prices of scrap, inner tubes, mechanicals and tires continued to decline slightly in May. Those for shoes and hard rubber remained unchanged except black boot and shoe scrap which declined 7/8 of a cent.

AIR BRAKE HOSE. The demand for air brake hose is very good. Ordinary fell off $2 to $3 per ton while regular soft declined $5 per ton.

BOOTS AND SHOES. The market on these grades is very quiet, due in part to the lesser call for shoe reclaim, particularly in the automobile topping trade.

INNER TUBES. The call for inner tube scrap is good at prices but slightly under those of a month ago.

TIRES. Collections of tires are of moderate tonnage. Stocks are moving slowly in response to a fairly active demand from the reclaimers. The collecting area is broadening with the demand. Tires represent by far the largest proportion of the tonnage of waste rubber collected. It yields the highest general average quality reclaim and is therefore the main reliance of the reclaim industry.

Quotations for Carload Lots

May 24, 1927

Boots and Shoes			
Boots and shoes, black	lb.	$0.01⅞ @	$0.02
Red and white	lb.	.01 @	.01⅛
Trimmed arctics, black	lb.	.00⅞ @	.01
Untrimmed arctics	lb.	.00¾ @	.00⅞
Tennis shoes and soles	lb.	.00¾ @	.00⅞
Hard Rubber			
No. 1 hard rubber	lb.	.10 @	.10½
Battery jars, black compound	lb.	.01⅞ @	.02
Inner Tubes			
No. 1, floating	lb.	.08¼ @	.08¾
No. 2, compounded	lb.	.06¼ @	.06½
Red	lb.	.06 @	.06¼
Mechanicals			
Mixed black scrap	lb.	.01 @	.....
Heels	lb.	.00½ @	.00⅝
Hose, air-brake	ton	33.00 @	35.00
regular soft	ton	15.00 @	.....
No. 1 red	lb.	.01¾ @	.01⅞
No. 2 red	lb.	.01 @	.....
White, druggists' sundries	lb.	.03½ @	.....
Mechanical	lb.	.01½ @	.01⅝
Mixed tubes	lb.	.05¾ @	.05⅞
Tires			
Pneumatic Standard—			
Mixed auto tires with beads	ton	25.00	@26.00
Beadless	ton	34.50	@35.50
White auto tires with beads	ton	40.00	@42.00
Beadless	ton	50.00	@52.00
Mixed auto peelings	ton	32.00	@34.00
Solid—			
Mixed motor truck, clean	ton	30.00	@31.00

JAPAN'S IMPORTATIONS OF AMERICAN-MADE TIRES AND TUBES have gained steadily in value in recent years, as the following total values indicate: 1923, $777,259; 1924, $1,013,611; 1925, $1,090,135, and 1926, $1,248,610.

The following scrap rubber dealers are listed in our Buyers' Directory. For complete information see Index of Advertisers on Page 102.

Birkenstein, S., & Sons, Chicago, Illinois.
Chalfin, Joseph, & Co., Inc., New York, N. Y.
Cummings, Wm. H., & Sons, New York, N. Y.
Muehlstein, H., & Co., Inc., New York, N. Y.
Norton, M., & Co., Medford, Massachusetts.
Schnurmann, J., London, England.
Weber, Hermann, Hoboken, New Jersey.

United States Rubber Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	February, 1927		Two Months Ended February, 1927	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	63,475,079	$23,110,257	160,557,343	$59,863,976
Balata	77,177	24,329	199,785	66,643
Jelutong or Pontianak	1,361,361	213,901	3,276,848	585,889
Gutta percha	398,920	60,594	618,215	116,859
Guayule	954,048	229,286	1,609,148	383,819
Rubber scrap	2,036,206	117,289	3,944,099	197,957
Totals	68,302,791	$23,755,656	170,205,438	$61,215,143
Chicle *dutiable*	1,714,743	$826,530	3,059,394	$1,531,947
MANUFACTURED—*dutiable*				
Rubber belting	57,857	$29,748	127,814	$72,568
Rubber tires	194	4,031	342	8,378
Other manufactures of rubber	.....	107,802	.....	220,206
Totals	58,051	$141,581	128,156	$301,152

EXPORTS OF FOREIGN MERCHANDISE

RUBBER AND MANUFACTURES				
Crude rubber	5,490,913	$2,277,297	8,908,216	$3,722,031
Balata	.....	.....	10,714	4,881
Gutta percha and rubber substitutes and scrap	10,929	1,003	11,145	1,083
Rubber manufactures	.....	38,946	.....	41,394
Totals	5,501,842	$2,317,246	8,930,075	$3,769,389

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED				
India Rubber				
Reclaimed	1,502,444	$178,208	3,128,093	$377,948
Scrap and old	1,584,577	106,829	3,763,535	225,449
Footwear				
Boots *pairs*	37,728	102,856	89,596	234,534
Shoes *pairs*	84,985	77,562	162,224	143,644
Canvas shoes with rubber soles *pairs*	422,726	299,766	756,477	550,763
Rubber water bottles and fountain syringes *number*	15,614	10,014	46,709	28,406
Rubber gloves *doz. pairs*	5,925	20,216	11,017	33,942
Other druggists' rubber sundries	.....	26,162	.....	64,021
Bathing caps *doz.*	17,209	35,955	22,948	53,384
Hard rubber goods				
Electrical hard rubber goods	111,972	25,824	281,831	68,601
Other hard rubber goods	.....	24,334	.....	44,561
Tires				
Casings, automobile *number*	219,543	2,673,210	412,502	5,110,208
Tubes, automobile *number*	113,522	211,459	231,208	475,188
Other casings and tubes *number*	3,951	11,662	5,800	20,374
Solid tires for automobiles and motor trucks *number*	11,019	343,105	21,481	623,772
Others	90,300	25,050	154,588	44,959
Tire accessories	.....	102,492	.....	199,981
Rubber and friction tape	162,121	30,507	263,855	62,879
Belting	422,213	225,104	833,250	440,623
Hose	537,406	195,497	1,134,238	442,955
Packing	214,638	90,921	410,624	187,429
Soles and heels	464,195	163,404	771,919	273,658
Thread	78,761	102,636	214,781	276,455
Rubber bands and erasers	43,542	37,236	114,397	91,032
Other rubber manufactures	.....	182,736	.....	372,147
Totals	.....	$5,302,745	.....	$10,446,913
Rubber toys, balls and balloons	.....	$18,032	.....	$31,064
Rubber balloons *gross*	32,073	$43,980	56,612	$77,926

Imports of Crude Rubber Into the United States by Customs Districts

	*March, 1927		Three Months Ended *March, 1927	
	Pounds	Value	Pounds	Value
Massachusetts	5,265,625	$1,956,029	15,710,299	$5,746,795
St. Lawrence	.....	.....	6,864	2,265
New York	70,500,886	25,354,715	214,028,804	78,982,292
Philadelphia	392,030	135,166	392,030	135,166
Maryland	664,864	231,303	2,902,550	1,041,178
New Orleans	.....	.....	2,057	227
Los Angeles	1,192,188	422,745	4,397,130	1,612,323
San Francisco	1,330,092	512,034	2,099,294	814,060
Oregon	83,986	33,711	302,386	119,757
Colorado	123,200	47,313	268,800	102,929
Totals	79,552,871	$28,693,016	240,110,214	$88,556,992

*Including Latex Dry Rubber Content.

A. C. S. FALL MEETING

The seventy-fourth meeting of the American Chemical Society will be held the week beginning Monday, September 5, 1927, at Detroit, Michigan. The preliminary program will appear June 20 and the final program August 20.

Compounding Ingredients Market

PRACTICALLY all divisions of the rubber manufacturing industry are operating at approximately capacity output and are utilizing compounding ingredients at a large and steady rate. Tire prices seem to be stabilized regardless of a reported disposition on the part of some makers to advance them. Prices on all ingredients are firm and steady.

ACCELERATORS. The industry in all lines is evincing an active interest in low temperature curing, rendered possible by the employment of semi-ultra accelerators. Some at least of this type of accelerators exert considerable anti-oxidant effect. Other accelerators that do not exhibit this effect are at more or less disadvantage although they are competing successfully in definite lines of work.

ANTI-OXIDANTS. Anti-oxidants are accepted by all the principal rubber manufacturing concerns and in a relatively shorter time than was the case with accelerators. They will be universally adopted. The demand for them is steadily growing as their value is realized with their growing use.

BENZOL. There have been no price changes in the past month. Stocks are liberal and the demand increasing under fairly steady market conditions.

CARBON BLACK. During the month production and shipments from the Monroe field in Louisiana were somewhat reduced by partial shutdown owing to flood conditions on the Mississippi river. Later conditions improved. Prices are firm and unchanged and stocks are moving well into the rubber and other trades.

LITHARGE. Prices were easy as May opened and soon dropped ½ cent a pound owing to decline in pig lead. Trade was fairly active, buyers being protected for several months ahead. A further reduction of ¼ cent a pound was reported May 21.

LITHOPONE. No quotable changes occurred. Buyers were not interested beyond their needs for June. Sellers were contracting six months ahead on the basis of current quotations and there was little spot activity.

MINERAL RUBBER. The demand for mineral rubber continues without reduction in tonnage at steady prices.

SOLVENT NAPHTHA. Supplies have increased in volume due to the heavy production of toluene. The market is fairly steady and the demand active.

STEARIC ACID. This material has become established as an important ingredient for stabilization of crude rubber and activator of accelerators. It is being used very generally in the more important lines of rubber goods.

ZINC OXIDE. Early in the month demand slackened and shading on spot was reported due to weakness of zinc metal. Later the movement was fair with prices steady and unchanged.

New York Quotations

May 25, 1927

Accelerators. Inorganic

Lead, carbonate	lb.	$0.09¼	@
Lead, red	lb.	.10	@
sublimed white	lb.	.09	@
sublimed blue	lb.	.09	@
super-sublimed white lead	lb.	.09½	@
Lime, R. M. hydrated	ton	15.00	@
Litharge	lb.	.09¼	@
Magnesia cal., light (bbls.)	lb.	.30	@
calcined, extra light (bbls.)	lb.	.50	@
calcined, heavy (bbls.)	lb.	.04	@
magnesium, carb., light		.06	@ .06½
Orange mineral A.A.A	lb.	.12¾	@

Accelerators, Organic

Aldehyde ammonia	lb.	.80	@ .85
Crylene, hard form	lb.		@
Paste	lb.		@
Di-ortho-tolylguanidine	lb.	.85	@ .90
Diphenyl guanidine	lb.	.68	@ .72
Ethylidine aniline	lb.	.60	@ .65
Formaldehyde aniline	lb.	.38	@ .42
P. A. C.	lb.	.11¼	@ .11¾
Grasselerator 102	lb.	.80	@ .82½
552	lb.	4.80	@ 5.00
808	lb.	1.15	@ 1.35
Heptene	lb.		@
Hexamethylene tetramine	lb.	.80	@ .82½
Lithex	lb.		@
Methylene dianiline	lb.	.38	@ .40
Monex	lb.		@
No. 999 lead oleate	lb.	.15¾	@
Phenyl orthotolyl guanidine	lb.	.76½	@ .81
Piperidine penta-dithio-carb.	lb.	4.80	@ 5.00
R. & H. 50 (100 lb. drums)		.55	@ .60
Tensilac No. 39	lb.	.55	@ .60
No. 41	lb.	.65	@ .68
Thionex	lb.	3.25	@
Thiocarbanilid	lb.	.26	@ .28½
Trimene	lb.		@
base	lb.		@
Triphenylguanidine	lb.	.69	@ .73
Vulcanex	lb.	.86	@
Vulcanol	lb.	1.08	@
Vulcone	lb.	.74	@

Acids

Acetic 28% (bbls.)	100 lbs.	3.37½	@
glacial (carboys)	100 lbs.	12.41	@
Oleic	lb.	.09½	@ .10
Stearic	lb.	.13½	@ .14
Sulphuric, 66%	100 lbs.	1.60	@

Alkalies

Caustic soda, solid	100 lb.	$3.00	@

Anti-Oxidants

Antox	lb.	$0.83	@
V. G. B.	lb.		@

Colors

BLACK

Bone	lb.	.05	@ .21
Carbon (see Comp. Ing.)			
A. & W. nonfil No. 1	lb.	.40	@
No. 2	lb.	.25	@
Drop	lb.	.06	@ .10
Lampblack (commercial)	lb.	.09	@

BLUE

A. & W. blue	lb.	1.25	@ 5.00
Du Pont, N.	100 lbs.	1.35	@
Marine, A. C.	100 lbs.	1.30	@
5 R	100 lbs.	1.00	@
2 G	100 lbs.	.90	@
Prussian	lb.	.33	@ .35
Ultramarine	lb.	.08	@ .35

BROWN

Sienna, Italian	lb.	.04	@ .08

GREEN

A. & W. green	lb.	1.25	@ 3.00
Chrome, light	lb.	.27	@ .31
medium	lb.	.29	@ .32
dark	lb.	.31	@ .34
Du Pont, A. C.	100 lbs.	3.00	@
4 G	100 lbs.	.60	@
G. L.	100 lbs.	.30	@
Y. L.	100 lbs.	.75	@
Oxide of chromium	lb.	.38	@

ORANGE

Du Pont, 2 R	100 lbs.	1.40	@
R. X.	100 lbs.	1.30	@
Y. O.	100 lbs.	1.60	@

RED

A. & W. red	lb.	.75	@ 3.50
purple	lb.	2.00	@ 4.00
Antimony, golden, No. 40	lb.	.22	@ .25
No. 60	lb.	.16	@ .20
golden 15/17%	lb.	.16	@ .20
T. K. "Special" 1%	lb.	.38	@
Fentasulphide 15/17%	lb.	.18	@
Antimony,			
Crimson, R.M.P. No. 3	lb.	$0.48	@
Sulphur free	lb.	.50	@
T. K. 15/17%	lb.	.40	@

Colors—*(Continued)*

7-A	lb	$0.35	@
Z-2	lb.	.20	@
Vermilion, No. 5	lb.	.50	@ .55
No. 15	lb.	.37½	@ .42
Du Pont R. I.	100 lbs.	2.00	@
6 B	100 lbs.	1.10	@
Brilliant A. C.	100 lbs.	1.05	@

Iron Oxides

bright pure domestic	lb.	.12	@
bright pure English	lb.	.14	@
bright reduced English	lb.	.10½	@
bright reduced domestic	lb.	.10	@
Indian (maroon), pure domestic	lb.	.11	@
Indian (maroon), pure English	lb.	.10½	@ .11½
Indian (maroon), reduced English	lb.	.09½	@ .10½
Indian (maroon), reduced domestic	lb.	.08	@
Oximony	lb.	.13¼	@
Spanish red oxide	lb.	.04	@
Venetian reds	lb.	.02	@ .06
Vermilion, English quicksilver	lb.	1.97	@ 2.00

WHITE

Lithopone	lb.	.05½	@
Azolith	lb.	.05¼	@ .05¾
Grasselli	lb.	.05¼	@
Sterling	lb.	.05½	@ .06½
Zinc Oxide			
AAA (lead free)	lb.		@
Azo (factory):			
ZZZ (lead free)	lb.	.06½	@ .07
ZZ (leaded)	lb.	.06¾	@ .07½
Z (8% leaded)	lb	.06¾	@ .07½
French Process			
Green seal	lb.	.10¾	@
Red seal	lb.	.09¾	@
White seal	lb.	.11¾	@

YELLOW

A. & W. yellow	lb.	2.00	@ 4.00
T. K. sulphide	lb.	.65	@
Cadmium sulphide	lb.	1.50	@ 2.00
Chrome	lb.	.16½	@ .18
Du Pont N.	100 lbs.	4.00	@
R. R.	100 lbs.	1.55	@
Grasselli cadmium	lb.	1.50	@
Ochre, domestic	lb.	.05½	@ .07
imported	lb.	.03	@ .03½
Oxide, pure	lb.	.11	@
Zinc	lb.	.24	@

New York Quotations

May 25, 1927

Compounding Ingredients

Aluminum flake (sacks c.l.)	ton	$21.85	@
(sacks l.c.l.)	ton	24.50	@
Ammonium carbonate powd.	lb.	.12	@
lump	lb.	.11	@
Asbestine	ton	13.40	@14.50
Barium, carbonate	ton	55.00	@
dust	lb.	.05	@ .06
sulphate	lb.	.11	@ .15
Barytes, imported	ton	27.00	@36.00
water ground and floated	ton	34.00	@35.00
Basofor	lb.	.04½	@
Blanc fixe, dry	ton	85.00	@90.00
pulp	ton	60.00	@63.00
Carbon Black			
Aerfloted arrow	lb.	.09	@ .13
Compressed	lb.	.07½	@ .11¾
Uncompressed	lb.	.07	@ .11
Micronex	lb.	.08	@ .12
Carrara filler	lb.	.01¾	@
Chalk	ton	12.00	@
Clay china	lb.	.01½	@
Mineral flour (Florida)	ton	20.00	@23.00
Perfection	ton	14.00	@
Suprex	ton	13.00	@26.00
Cotton flock, black	lb.	.10½	@ .12½
light-colored	lb.	.11	@ .12
white	lb.	.12½	@ .22
Fossil flour	lb.	.02¼	@
Glue, high grade	lb.	.22	@ .26
low grade	lb.	.18	@ .22
Infusorial earth	lb.	.02¼	@
Mica, amber (fact'y)	lb.	.05	@
Pumice stone, powd.	lb.	.02½	@ .04
Rotten stone (bbls.)	lb.	.02½	@ .04½
Soap bark	lb.	.13	@ .14
Soapstone	ton	15.00	@22.00
Stearex	lb.	.10	@ .14
Talc, domestic	lb.	.01¾	@
French	ton	18.00	@22.00
Velvetex	lb.	.04	@ .07

Compounding Ingredients—*(Continued)*

Whiting:			
Commercial	100 lbs.	$0.85	@$1.00
English, cliffstone	100 lbs.	1.50	@
Snow white	ton	12.00	@23.60
Westminster Brand	100 lbs.		@
Witco (c.l.) (fact'y)	ton	15.00	@
Whiting, imp. chalk	100 lbs.	1.00	@ 1.25
Paris White, Eng. Cliff	100 lbs.	1.60	@ 2.50

Mineral Rubber

Genasco (facty.)	ton	50.00	@52.00
Gilsonite (fact'y)	ton	37.14	@39.65
Hydrocarbon, sott	ton	28.00	@34.00
Ohmlac Kapack, M. R.	ton	60.00	@
M-4	ton	175.00	@
Paradura (fact'y)	ton	62.50	@65.00
Pioneer, M. R., solid (fac.)	ton	41.00	@43.00
M. R. granulated	ton	51.00	@53.00
Robertson, M. R. solid (facty.)	ton	34.00	@80.00
M. R. gran. (facty.)	ton	34.00	@80.00

Oils (Softeners)

Castor, No. 1, U. S. P.	lb.	.13½	@
No. 3, U. S. P.	lb.	.13	@
Corn, crude (bbls.)	lb.	.12	@
Cotton	lb.	.09	@ .10½
Degras	lb.	.04¾	@ .05
Fluxrite fluid	lb.	.05	@ .06
solid	lb.	.05	@ .06
Glycerine	lb.	.26	@ .26½
Linseed, raw	lb.	.11	@ .12
Palm lagos (bbls.)	lb.	.10	@
niger (bbls.)	lb.	.09½	@
Peanut, crude	lb.	.13	@
refined	lb.	.15	@
Petrolatum, standard	lb.	.05¼	@
Pine, steam distilled	gal.	.72	@
Plastone	lb	.39	@
Rapeseed, refined	lb.	.12	@
Rosin	gal.	.55	@ .62

Resins and Pitches

Pitch	bbl.	9.50	@10.50
Rosin, K (bbl.)	280 lbs.	10.75	@
Shellac, fine orange	lb.	.70	@
Tar, retort	bbl.	16.50	@17.00

Solvents

Benzol (90%, 7.21 lbs. gal.) pure	gal.	$0.29	@
Carbon bisulphide (10.81 lbs. gal.) 99.9% pure (drums)	lb.	.05½	@ .06¼
tetrachloride (13.28 lbs. gal.) 99.7% pure (drums)	lb.	.07½	@ .08
Gasoline			
No. 303			
Tankcars	gal.	.18	@
Drums, c. l.	gal.	.23	@
Drums, l. c. l.	gal.	.25	@
Naphtha	gal.	.10¼	@ .14
Turpentine, spirits	gal.	.56½	@ .67½
wood, steam distilled	gal.	.64	@ .66

Substitutes

Black	lb.	.08	@ .14
Brown	lb.	.08	@ .16
White	lb.	.09	@ 1.65

Vulcanizing Ingredients

Sulphur			
Velvet flour	100 lbs.	2.60	@ 3.50
Soft rubber (c.l.)	100 lbs.	2.60	@ 2.95
(l.c.l.)	100 lbs.	2.95	@ 3.30
Superfine commercial flour (c.l.)	lb.	2.20	@ 2.90
(l.c.l.)	lb.	2.80	@ 3.10
Tire brand, superfine	100 lbs.	2.20	@ 2.55
Tube brand, velvet	100 lbs.	2.60	@ 2.95
(See also Colors—Antimony)			

Waxes

Beeswax, white, com.	lb.	.55	@
carnauba	lb.	.38	@ .50
ceresine white	lb.	.12	@
montan	lb.	.07	@ .07½
ozokerite, black	lb.	.27	@
green	lb.	.28	@

Paraffin

122/124 white crude scale	lb.	.03	@
124/126 white crude scale	lb.	.03¾	@
123/125 fully refined	lb.	.04½	@ .04¼
125/127 fully refined	lb.	.04¼	@ .04⅜

IMPROVED RUBBER NAPHTHA

The following range of specifications illustrates the views of various tire manufacturers in the matter of specifications for the naphtha they use. Initial boiling points 104, 110, 113, 121, and 125 degrees F., end points 290, 300, 315, 325, and 392 degrees F.

The practical development of an ideal rubber naphtha was based on the experience of the cleaning and dyeing industry where great fire hazards needed to be reduced by raising the initial points of the solvent.

Rubber chemists like those in many other industries are not informed on petroleum products and their freakish nature. For example a test of the drying time between two similar petroleum products is not a correct test as the action of the rubber when mixed with the solvent slows up the drying time considerably. In fact the drying time of the rubber cement is greater than either of the solvents. This is true in most cases where two products of any nature are mixed, as the identity of each individual product is lost in the combination.

The dipped goods branch of the rubber industry has been using for years a naphtha known as cleaners' and dyers' naphtha. This grade might also be known as V M & P, signifying varnish makers' and painters' grade, because it has approximately the same specification.

Specifications of cleaners' and dyers' naphtha in various sections of the United States range from 180 to 210 degrees F., initial point, and from 325 to 350 degrees, end point. The drying time of this product is between 3 and 4 minutes by the spot test. An improved grade has been developed for dipped goods and general cement work that dries rapidly. While its initial boiling point is high enough so that the material is not affected by the ordinary working room temperature, its specifications are initial point approximately 160 degrees F., end point under 300 degrees F. and spot test one minute and a quarter. Practically this initial boiling point is far enough above the room temperature so that agitation of the solution will not occur.

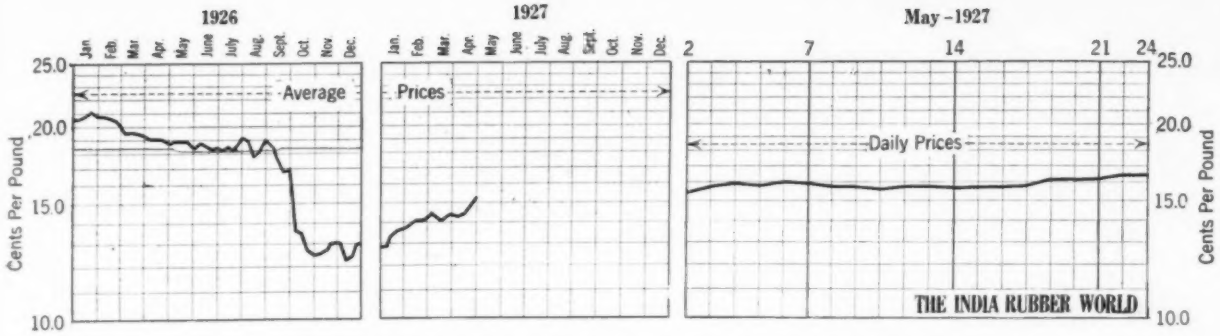
By the improved process of treatment of the naphtha all the unsaturates and other alien compounds are removed; therefore, there is no chemical action on the rubber after it is dissolved. It is well to observe that unsaturated hydrocarbons in oil are always in a state of unrest and striving to saturate or stabilize themselves. The presence of these unsaturated bodies is very likely to be the cause of much blister troubles because their action prevents the bubbles from settling out in the dipping tanks.

In the case of rubber shoe cement, naphtha of the new specification is especially satisfactory because it liberates less vapor in the work rooms. Also in spreader work, for the same reason, fewer fires are caused by static electricity.

By special tower equipment it is possible to reduce the gravity of the naphtha from 59 degrees to 60 degrees Beaumé with the initial point from 145 to 160 degrees F. and end point at 300 degrees F. or lower. The low end point is a protection against any oil residue and also assures a quickly drying product, yet one that will not evaporate so rapidly as the usual high gravity low initial product.

MARCH TIRE EXPORTS

A new volume record for tire exports was established in March, 1927, according to the Department of Commerce, the casings shipped numbering 261,000, as against the February figure of 231,000 casings, and that of January of 214,000. The total for the three months of 706,000 casings compares very favorably with the shipments of approximately 687,000 casings in the first five months of 1926. The five best markets during March, taking 46.6 per cent by volume and 46.1 per cent by value of the total automobile casing exports, were in the following order: United Kingdom, Argentina, Germany, Australia, and Brazil.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

Market for Cotton and Fabrics

AMERICAN COTTON. The price for spot middling cotton in May rose from 15.45 cents on May 2 to 16.55 cents on May 24. This was due largely to the Mississippi River flood devastation of acreage assumed to represent a probable producing capacity of about 2,000,000 bales. Where the waters have receded in the northern sections of the flooded territory planting has already begun. At best the crop will get a very late start in the Mississippi Valley.

Government revised figures on last year's crop show that 48,730,000 acres were planted and 47,087,000 acres harvested. The average yield of lint cotton per acre was calculated at 181.9 pounds. The total production picked was 17,911,000 bales.

The outstanding fact of the cotton and fabrics markets continues to be the enormous exports of the staple and an accelerated interest in cotton cloth among distributers and consumers.

EGYPTIAN COTTON. Extra long cotton staples, owing to their plentiful supply, would seem to be rather dear at present. Crop advices from both Egypt and Arizona are thus far satisfactory. It is now generally agreed that the acreage planted in Egypt will be about 15 per cent below that of last year. On the other hand in Arizona the acreage may be practically doubled.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The cotton market is very strong. The goods market is slowly but certainly following with a better price tone. More demand is noted for cloth for prompt shipment than has recently prevailed. Indications point toward a shortage of supplies to meet the demand for quick round lots. With a basis of 17,900,000 bales as the 1926 crop, and assuming the minimum exports at 11,000,000 bales, less spinnable cotton of the 1926 crop is left for American mills than needed to maintain their rate of consumption for the balance of the year. The sharp demand for fabrics is expected to continue on a higher price basis than has been obtained since October 1, 1926.

RAINCOAT FABRICS. The raincoat business is improving rapidly due to the wide distribution of spring rains and preparations for manufacturing fall stocks.

SHEETINGS. The recent advance in raw cotton prices has stimulated inquiries for cotton goods. Many users are now interested in long time contracts and business with various lines of manufacturing trades has been placed for delivery up to the end of the year and in some instances into the spring of 1928. Many constructions used in manufacturing industries are comparatively scarce for delivery within the next 30 to 60 days.

TIRE FABRICS. The demand for tire fabrics has absorbed much of the capacity of the mills and large consumers have practically covered their requirements for the third quarter. Quotations were somewhat irregular early in the month, but are now much firmer due to the advance in cotton and the fact that the fabric mills are well supplied with contracts and not inclined to shade prices. The fabric situation is described as sound and the mills in good position to offset pressure on the part of buyers.

New York Quotations

May 25, 1927

Drills

38-inch 2.00-yard	yard	$0.15¼@
40-inch 3.47-yard		.09½@
52-inch 1.90-yard		.16⅞@
52-inch 2.20-yard		.13¾@
59-inch 1.85-yard		.16 @
60-inch 1.52-yard		.21⅛@

Ducks

38-inch 2.00-yard	yard	.15¼@
40-inch 1.47-yard		.21⅜@
72-inch 16.66-ounce		.34⅜@
72-inch 17.21-ounce		.35½@

MECHANICAL

Hose and belting	pound	.30 @ .31
Specials		.34 @ .35

TENNIS

52-inch 1.35-yard	yard	.23¼@

Hollands

RUBBER TRADE SPECIAL

R. T. 3 A.

31-inch	yard	.20 @
40-inch		.25 @
50-inch		.45 @

RED SEAL

36-inch		.14½@
40-inch		.15 @
50-inch		.22½@

GOLD SEAL

40-inch, No. 72		.19 @
40-inch, No. 80		.20½@

Osnaburgs

40-inch 2.35-yard	yard	$0.13¼@
40-inch 2.48-yard		.12⅝@
40-inch 3.00-yard		.10½@
37-inch 2.42-yard		.13⅛@

Raincoat Fabrics

COTTON

Bombazine 60 x 64	yard	.10¾@
Bombazine 60 x 48		.09¾@
Plaids 60 x 48		.11⅛@
Plaids 48 x 48		.10¾@
Surface prints 60 x 48		.11¾@
Surface prints 64 x 60		.12¾@

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.11¼@
48 x 48, 2.85-yard		.10 @
64 x 68, 3.15 yard		.10¾@
56 x 60, 3.60-yard		.09½@
48 x 44, 3.75-yard		.08 @

Sheetings, 36-inch

48 x 48, 5.00-yard	yard	.06½@
44 x 40, 6.15-yard		.05¾@ .05½

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Egyptian, karded	pound	$0.49 @ .50
Peeler, karded		.40 @ .42

CORD 23/5/3

Egyptian, combed	pound	.55 @ .56
Egyptian, karded		.49 @ .51
Peeler, karded, 1 1/16-in.		.41 @ .43

CORD 23/4/3

Peeler, karded	pound	.44 @

CORD 23/3/3

Peeler, karded	pound	.45 @

CORD 13/3/3

Peeler, karded	pound	.41½@

CORD 13/3/3

Peeler, karded	pound	.41 @

LENO BREAKER

8-oz. Peeler, karded	pound	.40 @
10-oz. Peeler, karded		.40 @

CHAFER

8.25-oz. Peeler, karded (2 ply)	pound	@
9.5-oz. Peeler, karded (4-ply)		.50 @
12-oz. Peeler, karded		.48 @
14-oz. Peeler, karded		.49 @

The Cotton Outlook

Mississippi Flood Damages

DAMAGES reported to cotton because of the Mississippi floods are being found to be less than first accounts reported, the chief loss being in the long staple cotton areas. A member of the Crop Reporting Board has estimated that at the time of writing 2,000,000 acres were under water, while the reduction in the long staple crop was put at 200,000 bales. In estimating the loss to the industry *The Journal of Commerce* states:

Although the net reduction in the cotton crop due solely to the flood may not greatly concern the cotton mills of the country, the fact that the long staple cottons are especially hard hit by the delta overflow is a matter of concern to mills manufacturing cloths that require the utilization of longer cottons, since premiums already considered large will be exaggerated. Finally, among the most unfortunate results of the flood in relation to the cotton industry solely is the price instability reintroduced at a time when the mills had been looking forward to the future with some confidence.

The Textile World in a recent editorial entitled "Extra Staple Situation Critical" also says:

There is no longer any question but that the status of extra staple cottons, or staples longer than Association 7s (full 1 5/32) for the balance of this season and for the new crop is critical. The planting of such cottons last year was restricted very closely to the Delta areas of Mississippi, Arkansas and Louisiana now flooded, Delfos seed largely displacing such cottons on alluvial lands, and there is little hope that the waters will recede from inundated lands in time for their planting with slow-maturing extra staple cottons. It may mean a reduction in new crop acreage of Association 7s and longer staples of 25 to 50 per cent or even more, if, as some claim, much of the available supply of seed has been irretrievably damaged by the flood.

With the Egyptian Government committed to a radical reduction of acreage devoted to cotton this season there appears to be no hope of an increased yield of extra staples in any part of the world to offset the probable decrease in the Delta of the Mississippi. Even an expected moderate increase in the Pima supply is menaced by an extension of the pink bollworm quarantine. From the manufacturer's standpoint advance in extra staples is as untimely as it is unfortunate, for it coincides with the first marked improvement in demand for combed and fine count yarns and cloths that has been experienced for several years.

Semi-Annual Meeting of N. A. C. M.

The semi-annual meeting of the National Association of Cotton Manufacturers, held jointly with the American Cotton Manufacturers' Association in Atlantic City from May 12 to 14, was one of importance to the industry, many members attending. Suggestions and discussions regarding more active cooperation in the distribution of cotton mill products were of especial value. Walker D. Hines, president of the Cotton Textile Institute, and one of the chief speakers of the occasion, analyzed in his address some of the cotton industry's greatest problems. He said in part:

To an increasing extent the work of the institute will be carried on through group organizations. These are necessary because of the very wide variations in conditions affecting the different branches of the industry. While we speak of the cotton textile industry as a unit it in fact consists of a great many different branches and each has its distinctive problems. It would be impossible to bring into a single meeting any very extensive representation of the entire industry. On the other hand, by organizing a group confined to one branch of the industry, we can bring into a group meeting a very complete representation of that branch and the group will be in position to consider statistical problems, problems of cost accounting, problems of new uses, problems of simplification and standardization and any others that may arise.

The institute is supported by cotton textile mills having upwards of 21,000,000 spindles, this representing close to two-thirds of the active spindles in the country.

American Cotton Consumption and Exports

Statistics prepared by the Bureau of the Census, Department of Commerce, show that the cotton consumed in the United States during the nine months ended April 30 amounted to 5,337,820 bales, as contrasted with 4,959,126 bales for the same period of 1926. Cotton on hand in consuming establishments on April 30, 1927, is estimated at 1,894,993 bales, the figure for the same date last year being 1,637,062 bales.

The Department of Agriculture estimates cotton exports from August 1 to April 30 at 9,605,594 bales, as compared with 7,028,291 for the same period last season. The probable total for the season will, it is believed, reach fully 11,000,000 bales, this figure including shipments to Canada.

Final Cotton Estimates

Revised cotton estimates announced May 17 by the Department of Agriculture placed the 1926 production at 17,911,000 bales of 500 pounds gross, the area in cultivation on June 25, 1926, at 48,730,000 acres, the area picked at 47,087,000 acres and the yield of lint cotton picked per acre at 181.9 pounds.

Ginnings of the 1926 crop reported by the Census Bureau March 21 were 17,910,258 bales of 500 pounds gross. In its December report the Department of Agriculture estimated the 1926 crop at 18,618,000 bales, the area harvested at 47,653,000 acres and the yield of lint cotton per acre at 187 pounds.

Preceding crops, as similarly stated in the final estimate of the Department of Agriculture, amounted to 16,104,000 bales in 1926, to 13,628,000 in 1925, to 10,104,000 in 1924 and to 9,762,000 in 1923.

FIRELESS BOILERS

The future rubber mill will probably, some day, be equipped with fireless boilers. Modern progress along power plant lines is certainly rapid. We are led from one remarkable thing to another with such frequency these days that most of us have steeled ourselves to expect almost anything.

The latest sensation is a plant in Czechoslovakia which will operate with steam at 1,700 pounds per square inch and 900 degrees F. There will be no fire beneath the boilers that will furnish steam to the 18,000 kw. turbine. This feat will be accomplished by generating superheated steam in a separator superheater, and passing that superheated steam into the boiler where it will bubble up through the water in the drum and produce steam at 1,700-pound pressure. Steam will be pumped from the boiler into the superheater, whence it will pass back into the boiler.—W. F. Schaphorst, M. E.

United Kingdom Rubber Statistics

Imports

UNMANUFACTURED	March, 1927		Three Months Ended March, 1927	
Crude rubber	Pounds	Value	Pounds	Value
From—				
Straits Settlements	11,121,600	£922,585	36,206,300	£2,953,490
Federated Malay States	6,074,100	499,097	16,071,300	1,317,085
British India	1,914,200	157,174	4,316,800	352,701
Ceylon and Dependencies	2,648,500	213,791	11,861,400	948,656
Other Dutch possessions in Indian Seas	3,061,900	249,224	6,488,300	537,224
Dutch East Indies (except other Dutch possessions in Indian Seas	3,243,200	269,986	8,057,900	663,455
Other countries in East Indies and Pacific, not elsewhere specified	147,900	12,894	577,900	46,368
Brazil	1,933,800	126,486	3,937,400	249,940
Peru	2,700	204	2,700	204
South and Central America (except Brazil and Peru)	10,600	842	53,400	3,877
West Africa:				
French West Africa	1,900	95	62,700	3,379
Gold Coast	51,900	3,886	192,100	13,571
Other parts of West Africa	224,100	18,421	489,200	39,293
East Africa, including Madagascar	203,000	15,872	399,000	31,114
Other countries	270,600	20,698	445,900	32,819
Totals	30,910,000	£2,511,255	89,162,300	£7,193,176
Waste and reclaimed rubber	449,300	£9,578	1,573,400	£27,604
Gutta percha and balata	690,300	57,634	2,028,300	178,404
Rubber substitutes	11,900	491	53,600	2,087
Totals	1,151,500	£67,703	3,655,300	£208,095
MANUFACTURED				
Boots and shoes....*doz. pairs*	47,651	£70,142	111,554	£174,632
Tires and tubes				
Pneumatic				
Outer covers	.....	467,411	.....	1,132,411
Inner tubes	.....	68,655	.....	151,544
Solid tires	.....	33,165	.....	79,020
Other rubber manufactures	.....	158,029	.....	425,569
Totals	.....	£797,402	.....	£1,963,176

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	2,904,200	£24,738	7,179,700	£71,706
Rubber substitutes	67,500	1,477	209,200	4,919
Totals	2,971,700	£26,215	7,388,900	£76,625
MANUFACTURED				
Boots and shoes....*doz. pairs*	21,590	£32,095	50,038	£79,442
Tires and tubes				
Pneumatic				
Outer covers	.....	340,581	.....	881,753
Inner tubes	.....	69,283	.....	186,634
Solid tires	.....	32,881	.....	103,122
Other rubber manufactures	.....	249,165	.....	692,632
Totals	.....	£724,005	.....	£1,943,583

Exports—Colonial and Foreign

UNMANUFACTURED	March, 1927		Three Months Ended March, 1927	
Crude Rubber	Pounds	Value	Pounds	Value
To—				
Russia	1,756,300	£157,470	5,588,100	£607,509
Sweden, Norway and Denmark	155,200	14,138	566,500	54,136
Germany	2,438,300	194,675	6,012,900	482,586
Belgium	439,000	29,633	930,900	69,224
France	1,280,900	101,296	5,074,200	408,410
Spain	91,300	5,653	388,900	29,608
Italy	1,169,300	107,979	2,501,000	215,130
Other European countries	162,800	14,988	776,000	68,210
United States	3,092,000	231,786	6,815,000	533,703
Canada	5,800	502	9,400	1,010
Other countries	48,800	3,970	170,000	16,346
Totals	10,639,700	£862,090	28,832,900	£2,485,872
Waste and reclaimed rubber	13,200	£288	81,700	£1,817
Gutta percha and balata	45,200	6,252	124,900	13,857
Rubber substitutes	.....	.. ....	6,500	240
Totals	58,400	£6,540	213,100	£15,914
MANUFACTURED				
Boots and shoes....*doz. pairs*	848	£2,094	3,009	£7,146
Tires and tubes				
Pneumatic				
Outer covers	.....	83,048	.....	211,787
Inner tubes	.....	13,291	.....	29,021
Solid tires	.....	1,888	.....	3,593
Other rubber manufactures	.....	9,029	.....	24,996
Totals	.....	£109,350	.....	£276,543

SHIPMENTS BY AMERICAN MANUFACTURERS OF ELECTRICAL HARD rubber goods totaled for the year 1926 839,058 pounds, value $278,701.

Dominion of Canada Rubber Statistics

Imports of Crude and Manufactured Rubber

UNMANUFACTURED	February, 1927		Eleven Months Ended February, 1927	
	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.				
From United Kingdom	7,876	$3,073	110,102	$41,735
United States	5,099,189	2,017,161	37,687,386	17,132,464
Straits Settlements	626,294	225,496	3,538,419	1,440,725
Dutch East Indies	135,706	50,196	428,593	192,595
France	.....	.....	25,902	4,714
Other countries	.....	.....	11,200	15,600
Totals	5,869,065	$2,295,926	41,801,602	$18,827,833
Rubber recovered	939,503	$105,184	7,541,102	$909,545
Rubber, powdered and rubber or gutta percha scrap	586,897	30,873	6,881,604	416,084
Balata	588	269	6,588	4,237
Rubber substitutes	165,208	24,531	806,257	100,645
Totals	1,692,196	$160,857	15,235,551	$430,511
PARTLY MANUFACTURED				
Hard rubber sheets and rods	10,449	$3,855	96,828	$54,782
Hard rubber tubes	.....	1,171	.....	9,870
Rubber thread not covered	13,832	18,534	132,263	200,701
Totals	24,281	$23,560	229,091	$265,353
MANUFACTURED				
Belting	.....	$8,191	.....	$190,988
Hose	.....	15,547	.....	159,180
Packing	.....	2,858	.....	43,136
Boots and shoes.....*pairs*	2,934	8,679	62,167	110,588
Clothing, including waterproofed	.....	22,731	.....	211,630
Gloves	.....	1,615	.....	18,154
Hot water bottles	.....	1,918	.....	18,948
Tires, solid .....*number*	16	1,343	601	34,256
Tires, pneumatic .....*number*	4,171	14,981	37,854	265,823
Tires, tubes .....*number*	4,314	8,115	18,506	44,860
Elastic, round and flat	.....	14,576	.....	169,067
Mats and matting	.....	2,366	.....	39,965
Cement	.....	8,516	.....	83,717
Golf balls .....*dozen*	2,247	8,657	37,490	151,558
Heels, rubber .....*pairs*	40,252	2,023	267,202	15,676
Other rubber manufactures	.....	97,004	.....	1,145,250
Totals	.....	$219,120	.....	$2,702,796
Totals, rubber imports	.....	$2,699,463	.....	$23,226,493

Exports of Domestic and Foreign Rubber Goods

UNMANUFACTURED	February, 1927		Eleven Months Ended February, 1927	
	Produce of Canada	Re-Exports of Foreign Goods	Produce of Canada	Re-exports of Foreign Goods
	Value	Value	Value	Value
Crude and waste rubber	$24,157	.....	$273,402	.....
Totals	$24,157	.....	$273,402	.....
MANUFACTURED				
Belting	$41,736	.....	$502,151	.....
Canvas shoes with rubber soles	265,050	.....	3,451,778	.....
Boots and shoes	84,519	.....	2,441,377	.....
Clothing, including waterproofed	671	.....	21,576	.....
Hose	24,600	.....	259,291	.....
Tires, casings	1,787,350	.....	13,684,454	.....
Inner tubes	287,444	.....	2,324,590	.....
Solid	40,347	.....	284,321	.....
Other rubber manufactures	44,632	$3,769	553,579	$99,786
Totals	$2,576,349	$3,769	$23,523,117	$99,786
Totals, rubber exports	$2,600,506	$3,769	$23,796,519	$99,786

SCRAP RUBBER SHIPMENTS

The *Traffic Bulletin* published by the National Association of Waste Material Dealers, Inc., calls attention to scrap tire shipments, particularly the marking requirements for freight that is less than a carload. Where more than one car is required for a shipment, the overflow should be tied in bundles, and the bundles marked in accordance with classification rules. The association's classification committee also proposes certain ratings for used rubber-impregnated tire fabric, which should include fabric that is used as tire flaps or reliners. To this the following note is appended: "Ratings apply only on pieces of fabric stripped from worn out pneumatic rubber tires, having value other than for reclamation of raw materials." The measure is intended to protect shippers of scrap tire fabric where the material is used only for reclamation purposes.

Crude Rubber Arrivals at New York as Reported by Importers

Plantations

	Cases
April 15. By "Pres. Grant," Far East.	
Baird Rubber & Trading Co., Inc.	†50
Littlejohn & Co., Inc.	500
April 16. By "Volendam," Rotterdam.	
General Rubber Co.	73
Littlejohn & Co., Inc.	114
H. Muehlstein & Co., Inc.	134
April 18. By "American Farmer," London.	
Baird Rubber & Trading Co., Inc.	165
General Rubber Co.	262
H. Muehlstein & Co., Inc.	142
April 18. By "Caronia," London.	
Charles T. Wilson Co., Inc.	33
April 18. By "City of Johannesburg," Far East.	
H. A. Astlett & Co., Inc.	2,541
Baird Rubber & Trading Co., Inc.	1,792
Paul Bertuch & Co., Inc.	100
General Rubber Co.	3,805
Littlejohn & Co., Inc.	3,770
Meyer & Brown, Inc. pkgs.	150
The Meyer & Brown Corp. pkgs.	482
H. Muehlstein & Co., Inc.	135
Poel & Kelly, Inc.	*100
Poel & Kelly, Inc.	310
Rogers Brown & Crocker Bros., Inc.	1,150
Charles T. Wilson Co., Inc.	360
April 18. By "Mahanada," Far East.	
H. A. Astlett & Co.	400
Hood Rubber Co.	*85
The Meyer & Brown Corp. pkgs.	1,234
Rogers Brown & Crocker Bros., Inc.	658
Charles T. Wilson Co., Inc.	173
April 18. By "Missouri," London.	
Hood Rubber Co.	*513
April 18. By "Taiyo Maru," Far East.	
H. A. Astlett & Co.	†150
April 20. By "Silverbeech," Far East.	
H. A. Astlett & Co.	1,461
Baird Rubber & Trading Co., Inc.	1,342
General Rubber Co.	5,351
Haldane Bierrie & Co., Inc.	511
Littlejohn & Co., Inc.	2,085
The Meyer & Brown Corp. pkgs.	1,387
H. Muehlstein & Co., Inc.	461
Poel & Kelly, Inc.	1,550
Raw Products Co.	374
Rogers Brown & Crocker Bros., Inc.	2,000
Charles T. Wilson Co., Inc.	491
April 20. By "Weirbank," Far East.	
H. A. Astlett & Co.	1,911
Baird Rubber & Trading Co., Inc.	1,527
General Rubber Co.	1,848
Haldane Bierrie & Co., Inc.	50
Littlejohn & Co., Inc.	6,264
The Meyer & Brown Corp. pkgs.	3,308
H. Muehlstein & Co., Inc.	763
Poel & Kelly, Inc.	474
Raw Products Co.	370
Charles T. Wilson Co., Inc.	963
April 21. By "Minnetonka," London.	
Baird Rubber & Trading Co., Inc.	302
General Rubber Co.	250
Littlejohn & Co., Inc.	565
H. Muehlstein & Co., Inc.	502
Poel & Kelly, Inc.	600
Charles T. Wilson Co., Inc.	1,172
April 21. By "Pres. Wilson," Far East.	
H. A. Astlett & Co.	1,700
Baird Rubber & Trading Co., Inc.	1,459
Paul Bertuch & Co., Inc.	100
General Rubber Co.	2,491
Haldane Bierrie & Co., Inc.	848
Hood Rubber Co.	*85
Littlejohn & Co., Inc.	4,206
The Meyer & Brown Corp. pkgs.	1,460
H. Muehlstein & Co., Inc.	659
Poel & Kelly, Inc.	500
Poel & Kelly, Inc.	*750
Raw Products Co.	250
Rogers Brown & Crocker Bros., Inc.	850
Rogers Brown & Crocker Bros., Inc.	*112
Charles T. Wilson Co., Inc.	501
April 22. By "Schodack," Europe.	
General Rubber Co.	202
April 23. By "Asiatic Prince," Far East.	
H. A. Astlett & Co.	810
Baird Rubber & Trading Co., Inc.	1,983
General Rubber Co.	3,453
Haldane Bierrie & Co., Inc.	570
Littlejohn & Co., Inc.	3,910
The Meyer & Brown Corp. pkgs.	2,165
H. Muehlstein & Co., Inc.	460
Raw Products Co.	275
Rogers Brown & Crocker Bros., Inc.	1,570
Charles T. Wilson Co., Inc.	450
April 23. By "Rotterdam," Rotterdam.	
General Rubber Co.	88
Littlejohn & Co., Inc.	272
April 24. By "France Maru," Hamburg.	
The Meyer & Brown Corp. pkgs.	127
April 24. By "Pres. Madison," Far East.	
Poel & Kelly, Inc.	†100
April 24. By "Silverash," Far East.	
H. A. Astlett & Co.	1,472
Baird Rubber & Trading Co., Inc.	850
General Rubber Co.	8,801
Haldane Bierrie & Co., Inc.	151
Hood Rubber Co.	*100
Littlejohn & Co., Inc.	2,492
Meyer & Brown, Inc.	116
The Meyer & Brown Corp. pkgs.	1,545
H. Muehlstein & Co., Inc.	1,050
Poel & Kelly, Inc.	416
Raw Products Co.	77
Rogers Brown & Crocker Bros., Inc.	34
Charles T. Wilson Co., Inc.	912
April 25. By "Raby Castle," Far East.	
H. A. Astlett & Co.	1,716
Baird Rubber & Trading Co., Inc.	640
Haldane Bierrie & Co., Inc.	152
Hood Rubber Co.	*131
Littlejohn & Co., Inc.	3,881
The Meyer & Brown Corp. pkgs.	2,108
H. Muehlstein & Co., Inc.	1,126
Poel & Kelly, Inc.	348
Raw Products Co.	547
Rogers Brown & Crocker Bros., Inc.	397
Charles T. Wilson Co., Inc.	1,571
April 25. By "American Banker," London.	
General Rubber Co.	4,731
H. Muehlstein & Co., Inc.	411
Raw Products Co.	143
Rogers Brown & Crocker Bros., Inc.	128
April 25. By "Baltic," Europe.	
General Rubber Co.	50
April 25. By "Steel Voyager," Far East.	
Baird Rubber & Trading Co., Inc.	868
General Rubber Co.	980
April 26. By "Carmania," London.	
Baird Rubber & Trading Co., Inc.	100
General Rubber Co.	20
Littlejohn & Co., Inc.	1,528
The Meyer & Brown Corp. pkgs.	494
Poel & Kelly, Inc.	51
Charles T. Wilson Co., Inc.	72
April 26. By "Cleveland," Europe.	
The Meyer & Brown Corp. pkgs.	70
H. Muehlstein & Co., Inc.	75
April 28. By "Tydeus," Far East.	
H. A. Astlett & Co., Inc.	2,749
Baird Rubber & Trading Co., Inc.	767
General Rubber Co.	11,345
Haldane Bierrie & Co., Inc.	50
Hood Rubber Co.	*42
Littlejohn & Co., Inc.	2,560
Meyer & Brown, Inc. pkgs.	118
The Meyer & Brown Corp. pkgs.	852
H. Muehlstein & Co., Inc.	1,618
Poel & Kelly, Inc.	497
Raw Products Co.	35
Rogers Brown & Crocker Bros., Inc.	607
Charles T. Wilson Co., Inc.	515
April 29. By "Antilochus," Far East.	
H. A. Astlett & Co.	1,243
Baird Rubber & Trading Co., Inc.	2,085
General Rubber Co.	2,484
Haldane Bierrie & Co., Inc.	650
Hood Rubber Co.	*135
Littlejohn & Co., Inc.	1,105
The Meyer & Brown Corp. pkgs.	761
H. Muehlstein & Co., Inc.	993
Poel & Kelly, Inc.	80
Raw Products Co.	100
Rogers Brown & Crocker Bros., Inc.	200
Charles T. Wilson Co., Inc.	307
April 29. By "Barbadian," London.	
General Rubber Co.	*5,312
Hood Rubber Co.	*294
H. Muehlstein & Co., Inc.	73
April 29. By "Mauretania," London.	
General Rubber Co.	22
April 29. By "Sydland," Marseilles.	
General Rubber Co.	80
April 30. By "Delilian," Far East.	
H. Muehlstein & Co., Inc.	650
April 30. By "Peleus," Far East.	
H. A. Astlett & Co.	300
Baird Rubber & Trading Co., Inc.	850
General Rubber Co.	1,130
Haldane Bierrie & Co., Inc.	70
Littlejohn & Co., Inc.	1,205
Meyer & Brown, Inc. pkgs.	23
The Meyer & Brown Corp. pkgs.	305
Poel & Kelly, Inc.	491
Raw Products Co.	60
Rogers Brown & Crocker Bros., Inc.	200
May 2. By "Cedric," Liverpool.	
Baird Rubber & Trading Co., Inc.	113
May 2. By "Laconia," London.	
Charles T. Wilson Co., Inc.	12
May 2. By "Minnewaska," London.	
Baird Rubber & Trading Co., Inc.	190
General Rubber Co.	920
Littlejohn & Co., Inc.	1,331
The Meyer & Brown Corp. pkgs.	141
May 2. By "Noordam," Rotterdam.	
General Rubber Co.	51
Rogers Brown & Crocker Bros., Inc.	69
May 2. By "Tuscania," London.	
Charles T. Wilson Co., Inc.	161
May 3. By "London Commerce," London.	
General Rubber Co.	33
Raw Products Co.	36
May 4. By "Kasama," Far East.	
H. A. Astlett & Co.	1,115
Baird Rubber & Trading Co., Inc.	112
General Rubber Co.	56
Littlejohn & Co., Inc.	224
H. Muehlstein & Co., Inc.	333
Poel & Kelly, Inc.	300
May 4. By "Matheran," Far East.	
H. A. Astlett & Co.	730
General Rubber Co.	530
Charles T. Wilson Co., Inc.	253
May 4. By "Salawati," Far East.	
H. A. Astlett & Co.	1,796
Baird Rubber & Trading Co., Inc.	488
General Rubber Co.	6,473
Haldane Bierrie & Co., Inc.	303
Hood Rubber Co.	*130
Littlejohn & Co., Inc.	2,643
Meyer & Brown, Inc. pkgs.	54
The Meyer & Brown Corp. pkgs.	443
The Meyer & Brown Corp. pkgs.	*210
H. Muehlstein & Co., Inc.	2,014
Poel & Kelly, Inc.	1,108
Raw Products Co.	807
Rogers Brown & Crocker Bros., Inc.	1,288
Charles T. Wilson Co., Inc.	1,348
May 5. By "City of Shanghai," Far East.	
H. A. Astlett & Co.	150
Littlejohn & Co., Inc.	688
May 5. By "Pres. Van Buren," Far East.	
H. A. Astlett & Co.	960
Baird Rubber & Trading Co., Inc.	1,854
General Rubber Co.	4,612
Haldane Bierrie & Co., Inc.	450
Hood Rubber Co.	*50
Littlejohn & Co., Inc.	2,946
The Meyer & Brown Corp. pkgs.	2,062
The Meyer & Brown Corp. pkgs.	*330
H. Muehlstein & Co., Inc.	574
Poel & Kelly, Inc.	821
Rogers Brown & Crocker Bros., Inc.	50
Charles T. Wilson Co., Inc.	224
May 6. By "Maimyo," Far East.	
General Rubber Co.	1,190
May 7. By "Veendam," Netherlands.	
Haldane Bierrie & Co., Inc.	107
The Meyer & Brown Corp. pkgs.	182
May 8. By "Pres. Jackson," Far East.	
H. A. Astlett & Co.	†250
Littlejohn & Co., Inc.	150
May 8. By "Steel Seafarer," Far East.	
H. A. Astlett & Co.	612
Baird Rubber & Trading Co., Inc.	466
General Rubber Co.	5,319
Haldane Bierrie & Co., Inc.	303
Littlejohn & Co., Inc.	3,318
Meyer & Brown, Inc. pkgs.	201
The Meyer & Brown Corp. pkgs.	164
The Meyer & Brown Corp. pkgs.	*140
H. Muehlstein & Co., Inc.	1,186
Poel & Kelly, Inc.	177
Rogers Brown & Crocker Bros., Inc.	112
Charles T. Wilson Co., Inc.	875
May 9. By "Scythia," Europe.	
Littlejohn & Co., Inc.	136
May 9. By "Tigre," Hamburg.	
Raw Products Co.	176
Rogers Brown & Crocker Bros., Inc.	225
May 10. By "McKeesport," Far East.	
H. Muehlstein & Co., Inc.	75
May 10. By "Minnesota," London.	
Baird Rubber & Trading Co., Inc.	631
General Rubber Co.	1,501
Littlejohn & Co., Inc.	626
The Meyer & Brown Corp. pkgs.	70
H. Muehlstein & Co., Inc.	154
Charles T. Wilson Co., Inc.	166
May 11. By "City of Bristol," Far East.	
H. A. Astlett & Co.	1,664
Baird Rubber & Trading Co., Inc.	3,200
General Rubber Co.	2,862
Haldane Bierrie & Co., Inc.	1,465
Hood Rubber Co.	*134
Littlejohn & Co., Inc.	2,341
The Meyer & Brown Corp. pkgs.	1,110
Poel & Kelly, Inc.	85
Raw Products Co.	140
Rogers Brown & Crocker Bros., Inc.	800

	Cases
May 11. By "Jufuku Maru," Europe.	
General Rubber Co.	210
May 12. By "Malayan Prince," Far East.	
H. A. Astlett & Co.	2,849
Baird Rubber & Trading Co., Inc.	964
General Rubber Co.	8,398
Haldane Bierrie & Co., Inc.	150
Littlejohn & Co., Inc.	5,004
Meyer & Brown, Inc.	pkgs. 81
The Meyer & Brown Corp.	pkgs. 2,153
Poel & Kelly, Inc.	203
Raw Products Co.	510
Rogers Brown & Crocker Bros., Inc.	189
Charles T. Wilson Co., Inc.	1,453
May 14. By "Nieuw Amsterdam," Rotterdam.	
General Rubber Co.	915
Littlejohn & Co., Inc.	292
May 16. By "Venice Maru," Far East.	
Hood Rubber Co.	*100
Rogers Brown & Crocker Bros., Inc.	1,096

*Arrived at Boston.
†Arrived at Pacific Coast.
‡Arrived at Laredo, Texas.

Africans

	Cases
April 15. By "Sarcoxie," Bordeaux.	
Littlejohn & Co., Inc.	872
April 19. By "Francisco," Antwerp.	
Littlejohn & Co., Inc.	111
April 24. By "France Maru," Hamburg.	
Littlejohn & Co., Inc.	954
May 7. By "Veendam," Europe.	
Littlejohn & Co., Inc.	978
May 10. By "Cathlamet," Africa.	
Littlejohn & Co., Inc.	75
May 11. By "Jufuku Maru," Europe.	
Littlejohn & Co., Inc.	396
May 14. By "Chicago," Europe.	
Littlejohn & Co., Inc.	255

Balata

	Cases
April 20. By "Stephen," Brazil.	
Paul Bertuch & Co., Inc.	2
May 11. By "Nickerie," Far East.	
Middleton & Co., Ltd.	bales 34

Guayule

	Cases
April 15. By "Monterey," Mexico.	
Baird Rubber & Trading Co., Inc.	560
April 20. By "S. B. Lund," Mexico.	
Continental Rubber Co. of New York.	‡1,060
April 23. By "Sutransco," Mexico.	
Continental Rubber Co. of New York.	1,120
April 27. By "Agwidale," Mexico.	
Continental Rubber Co. of New York.	560
May 3. by "S. B. Lund," Mexico.	
Continental Rubber Co. of New York.	560
May 4. By "Agwidale," Mexico.	
Continental Rubber Co. of New York.	‡2,680

Rubber Latex

	Gallons
April 20. By "Silverbeech," Far East.	
General Rubber Co.	84,994
April 23. By "Silverash," Far East.	
General Rubber Co.	82,880
May 8. By "Steel Seafarer," Far East.	
General Rubber Co.	67,173

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
April 10. By "Justin," Brazil.					
Littlejohn & Co., Inc.	852	16	329	662	...
April 20. By "Stephen," Brazil.					
H. A. Astlett & Co.	31	...	93	56	...
Paul Bertuch & Co., Inc.	94	...	...	...	...
General Rubber Co.	307	12	103	24	...
Littlejohn & Co., Inc.	789	...	144	13	...
The Meyer & Brown Corp.	pkgs. ...	...	34	...	...
May 3. By "Gretaston," Brazil.					
H. A. Astlett & Co.	8	2	47	26	...
Paul Bertuch & Co., Inc.	63	...	...	325	...
General Rubber Co.	167	18	193	139	...
Littlejohn & Co., Inc.	228	3	6	1,134	...
The Meyer & Brown Corp.	pkgs. ...	...	...	163	...

United States Crude and Waste Rubber Imports for 1927 (By Months)

	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1927	Total 1926	Balata	Miscellaneous	Waste
January...tons	42,646	2,378	269	299	144	...	45,736	38,697	106	1,508	447
February	25,326	1,668	213	203	190	...	27,600	34,067	119	935	953
March	33,114	1,176	206	253	329	...	35,078	42,677	82	674	531
April	45,843	1,822	351	229	418	10	48,673	32,678	109	1,317	631
Total, four months, 1927..tons	146,929	7,044	1,039	1,200	1,090	10	157,312	.....	416	4,434	2,562
Total, four months, 1926..tons	139,147	4,684	1,516	1,413	1,333	26	.....	148,119	178	3,463	2,496

Compiled from statistics supplied by the Rubber Association of America, Inc.

Statistics Compiled from Questionnaire[1] Covering the First Quarter of 1927

Reclaimed Rubber	Long Tons: Inventory at End of Quarter	Production	Shipments	Consumption
Reclaimers solely (7)	3,613	18,500	17,719	.....
Manufacturers who also reclaim (23)	11,381	27,047	12,221	19,208
Other manufacturers (75)	6,514	.....	.....	14,597
Totals	21,508	45,547	29,940	33,805

Scrap Rubber	Long Tons: Inventory at End of Quarter	Consumption in Manufacture Reclaimed	Due on Contract at End of Quarter
Reclaimers solely (7)	38,921	32,484	18,667
Manufacturers who also reclaim (21)	23,496	25,819	12,521
Other manufacturers (20)	390	.....	.....
Totals	62,807	58,303	31,188

Number of Tons of Crude Rubber Consumed in the Manufacture of Rubber Products and Total Sales Value of Shipments of Manufactured Rubber Products

Products	Number of Tons of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries:		
Automobile and motor truck pneumatic casings	60,679	$148,304,000
Automobile and motor truck pneumatic tubes	12,605	24,554,000
Motorcycle tires (casings and tubes)	81	449,000
Bicycle tires (single tubes, casings and tubes)	190	459,000
All other pneumatic casings and tubes not elsewhere specified	3	261,000
Solid and cushion tires	3,444	8,233,000
All other solid tires	87	267,000
Tire sundries and repair materials	1,488	5,123,000
Totals	78,577	$187,650,000

Products	Number of Tons of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Other Rubber Products:		
Mechanical rubber goods	4,045	$24,774,000
Boots and shoes	4,050	19,991,000
Insulated wire and insulating compounds	995	7,855,000
Druggists' sundries, medical, surgical and stationers' rubber goods	564	3,201,000
Waterproof cloth and clothing (except rubber sheeting)	827	5,100,000
Hard rubber goods	139	1,771,000
Heels and soles	885	4,334,000
Rubber flooring	190	1,057,000
Miscellaneous, not included in any of the above items	1,007	5,762,000
Totals	12,702	$73,845,000
Grand totals—all products	91,279	$261,495,000

Inventory of Crude Rubber in the United States and Afloat for United States Ports

	Long Tons: Plantation	Para	All Other	Totals
On Hand				
Manufacturers	63,448	3,411	2,246	68,105
Importers and dealers	11,812	1,731	585	14,128
Totals on hand	75,260	4,142	2,831	82,233
Afloat				
Manufacturers	14,773	4	29	14,806
Importers and dealers	29,154	1,103	321	30,578
Totals afloat	43,927	1,107	350	45,384

[1] Number of rubber manufacturers that reported data was 186; crude rubber importers and dealers, 42; reclaimers (solely), 7; total daily average number of employes on basis of third week of January, 1927, was 154,538.
It is estimated that the crude rubber consumption figures are *92 per cent of the total, and the crude rubber inventory 95 per cent of the total for the entire industry.
*Based on survey made by the Department of Commerce for the first six months of 1925.

United States Reclaimed Rubber Production and Consumption[1]

FINAL statistics compiled from returns received in reply to the Rubber Division questionnaire on the production and consumption of reclaimed rubber in the United States during 1926 are announced as follows:

TABLE 1

RECLAIMED RUBBER SURVEY, 1926

Firms Reporting		Long Tons
46	Production of reclaimed rubber	169,810.32
265	Consumption of reclaimed rubber	152,906.09
	Stocks of reclaimed rubber	
249	December 31, 1925	13,203.86
257	December 31, 1926	23,218.04
	Reclaimed rubber exported	
	Official customs statistics	5,390.90
95	Factory scrap reground and used by rubber manufacturers	13,278.38
	Production capacity of firms reclaiming rubber	
44	December 31, 1926	227,592.60

The total number of firms reporting statistics was 276. Operations of 34 additional plants were covered in these 276 individual reports. The number of "firms reporting" various items in Table 1 and Table 2 refers to separate companies and not to plants. Of these companies, 11 were manufacturers of reclaimed rubber, 35 were rubber manufacturers who also manufacture reclaimed rubber, and 230 were other rubber manufacturers. In addition, 179 rubber manufacturers reported that they neither produced nor used reclaimed rubber during 1926; 26 more were out of business, and 6 more without record of the amount of reclaimed rubber consumed.

A total of 99 firms, including 4 reclaimers, failed to submit statistics called for in the questionnaire. Of the firms not reporting consumption, only a few are perhaps important users of reclaimed rubber; all of the larger rubber manufacturers reported statistics.

Table 2 shows separate statistics reported by reclaimers, manufacturers who also reclaim, and other rubber manufacturers, for each item. The economy of regrinding uncured and vulcanized factory scrap and then using it in new batches of compound appears to be well recognized among rubber manufacturers, and although this scrap is not made into plastic reclaimed rubber, its use has a similar effect on the consumption of raw rubber.

TABLE 2

Firms Reporting		Long Tons
	RECLAIMERS SOLELY	
10	Stocks December 31, 1925	1,207.18
11	Stocks December 31, 1926	3,748.29
11	Production of reclaimed rubber, 1926	66,134.96
11	Production capacity December 31, 1926	93,204.20
	MANUFACTURERS WHO ALSO RECLAIM	
34	Stocks December 31, 1925	5,995.48
35	Stocks December 31, 1926	11,613.58
35	Production of reclaimed rubber, 1926	103,675.36
33	Production capacity December 31, 1926	134,388.40
35	Consumption of reclaimed rubber, 1926	74,844.96
19	Consumption of reground factory scrap	9,592.21
	OTHER MANUFACTURERS	
205	Stocks December 31, 1925	6,001.20
211	Stocks December 31, 1926	7,856.17
230	Consumption of reclaimed rubber, 1926	78,061.13
76	Consumption of reground factory scrap	3,686.17
	RECLAIMED RUBBER CONSUMPTION BY PRODUCTS	
83	In rubber tires and tubes	55,803.89
194	In other products	95,331.37
5	Undivided	1,770.83

Two rubber manufacturers who reported a limited production of reclaimed rubber during 1926 stopped reclaiming before the end of the year. One plant producing reclaimed rubber was burned in December, 1926, and no record of production was available. At the end of 1926, there were 49 firms producing reclaimed rubber in the United States, and 76 other rubber manufacturers regrinding factory scrap for further use in compounds.

1926 Reclaimed Production and Consumption

It is estimated that if all reclaimers had reported statistics the total production would be at least 180,000 long tons, and deducting the additions to stocks, and exports, the total consumption for 1926 is estimated at 164,500 tons minimum, exclusive of reground factory scrap. Compared with these estimates, the production reported is 94.3 per cent complete and the reported consumption 92.9 per cent complete.

The United States consumption of crude rubber in 1926 is generally placed at 366,000 long tons, and Rubber Association statistics indicate that 84 per cent was used in rubber tires and tubes. Statistics of 1926 reclaimed rubber consumption by products indicate that 37 per cent was consumed in the manufacture of tires.

On this basis, Table 3 has been compiled, comparing 1926 estimated totals with 1917 statistics published by the War Industries Board, and showing the ratio of reclaimed to crude rubber consumed. Quantities are in units of long tons.

TABLE 3

	1926			1917		
Consumed in	Crude	Reclaimed	%	Crude	Reclaimed	%
Rubber tires and tubes	307,440	60,865	19.8	110,270	21,006	19.0
Other rubber products	58,560	103,635	176.9	47,101	68,162	144.7
Total	366,000	164,500	45.0	157,371	89,168	56.7

The Rubber Division 1925 survey of production showed that 29 manufacturers of reclaimed rubber produced 141,676 long tons, while exports were officially reported as 4,571 long tons. Statistics of the Rubber Association showed little change in the stocks on hand at the beginning and end of 1925, and it is logical to assume that practically all the balance remaining after deducting exports from production, 137,105 long tons, went into consumption. The 1925 consumption of crude rubber was reported by the Bureau of the Census as 387,629 long tons, and the ratio of reclaimed to crude rubber consumed works out at 35.3 per cent.

TABLE 4

RELATIVE CONSUMPTION OF CRUDE AND RECLAIMED RUBBER

Year	Crude Rubber Long Tons	Reclaimed Rubber Long Tons	Ratio Reclaimed to Crude Per Cent
1917	157,371	89,168	56.7
1919	202,303	73,535	36.3
1920	196,270	75,297	38.4
1921	169,308	41,351	24.4
1922	283,271	54,458	19.2
1923	274,956	69,534	25.3
1924	301,778	76,072	25.2
1925	387,629	137,105	35.3
1926	366,000	164,500	45.0

Similar official statistics for other years do not exist, but Table 4, based on Rubber Association statistics for 1919 to 1924 inclusive, is believed to represent quite accurately the annual trend in use of reclaimed rubber.

WITH THE COMING OF GREATER WEALTH TO SUMATRA AND THE opening up of new estates, the southern sections of the island are meeting with important developments also. In Telok Betong, at the extreme southern end of Sumatra, the exports of crude rubber, according to *Commerce Reports*, increased from 905 metric tons during the first six months of 1925 to 1,104 tons in the corresponding period of 1926. In Palembang, however, 330 miles further north, the shipments declined from 8,628 tons in the first half of 1925 to 3,049 for the first six months of 1926, exports of gutta jelutong being 152 and 40 metric tons.

[1]Special Circular No. 1501, Rubber Division, Department of Commerce, Washington, D. C.